

**United States Department of Agriculture
Project Initiation**

Project Data for Accession Number 1014448

Project Title

Evaluation and Performance of Ornamentals and Vegetables

Project Details

Sponsoring Institution National Institute of Food and Agriculture	Project Status COMPLETE
Funding Source NIFA Formula	Grant Year 2018
Grant No.	Cumulative Award Amt. N/A
Proposal No.	Multistate No. (N/A)
Project Start Date Oct 10, 2017	Project End Date Sep 30, 2021
Program Code	

Project Director

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Recipient Organization

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Performing Department

School of Plant, Environmental, and Soil Sciences

Non Technical Summary

The commercial nursery and landscape industry (green industry) in Louisiana includes wholesale production of nursery, greenhouse, and floriculture related crops, retail garden center sales, landscape contracting and maintenance, arboriculture, and turfgrass. The value of the green industry in Louisiana is estimated at approximately \$2.2 billion annually and employs over 56,000 individuals. Evaluation of ornamental and vegetable plants for the landscape and home gardens is part of the mission of the LSU AgCenter Botanic Gardens at Burden in Baton Rouge. The Botanic Gardens focus on new introductions of roses, herbaceous ornamentals, and vegetables. Rose evaluations are conducted through two national evaluation programs; American Garden Rose Selections (AGRS) and the American Rose Trials for Sustainability (ARTS). Herbaceous ornamental and vegetable evaluations are conducted through the All-America Selections programs. Roses account for \$12-15 million in wholesale sales annually in Louisiana and are a very popular commercial landscape and retail garden center item. Sales of herbaceous ornamentals and vegetable transplants was \$31.3 billion in 2015. Consumer trends indicate 46 percent of U.S.

United States Department of Agriculture
Project Initiation

consumers purchase outdoor bedding and garden plants. The American Garden Rose Selections evaluates disease resistance, hardiness, attractiveness, and habit (sustainability and marketing). The goal of the American Rose Trials for Sustainability program is to identify through regional evaluation under low-input the most disease- and pest-resistant, hardiest and most garden-worthy rose cultivars. Results provide objective, accurate and reliable information about the cultivars tested for each region to the industry and gardening public. The All-American Selections (AAS) trial program was founded in 1932 and consists of approximately 80 trial sites throughout the US and Canada. The trials evaluate ornamental herbaceous annuals, perennial landscape plants, and vegetables for home gardens. Each site must have an official judge that evaluates the trial plants based on chosen current varieties in the market that have very similar traits to the trial entry (market standards). The standard AAS National Winner designation recognizes an ornamental or edible plant for significant breeding achievements, proven to demonstrate superior garden performance as compared to other like varieties on the market. Judges evaluate characteristics such as earliness, taste, disease-resistance, uniqueness and more, depending on the species. The AAS Regional Winner designation is awarded to varieties that do not perform exceptionally well in all regions but instead exhibit specific performance in just a few specific regions of North America. Nurseries and home gardeners can use the information from these trials to choose adapted varieties that have qualities (appearance, earliness, flavor, yield, disease resistance, etc.) of interest.

Animal Health Component

Animal Health Component: 0%

Research Effort Categories

Basic	0%
Applied	80%
Developmental	20%

Classification

Knowledge Area (KA)	Subject of Investigation (SOI)	Field of Science (FOS)	Percent
205	2160	1060	25%
203	2160	1060	50%
202	2160	1060	25%

Knowledge Area

- [205] Plant Management Systems
- [203] Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- [202] Plant Genetic Resources

Subject Of Investigation

- [2160] Arboreta and botanical gardens

Field Of Science

- [1060] Biology (whole systems)

United States Department of Agriculture Project Initiation

Keywords

Vegetables, Ornamentals, Evaluation, Sustainability, Performance, Varieties

Goals / Objectives

Participate in two national evaluation plant trials- American Garden Rose Selections and American Rose Trials for Sustainability- to identify newer disease resistant, regionally adapted rose varieties. Evaluate performance of herbaceous ornamentals and vegetables through the All-America Selections Program.

Project Methods

The roses evaluated in the AGRS and ARTS programs are shipped as bare root or containerized plants and planted each February. Five roses of each variety or five replications will be planted with the other trial roses in a completely randomized design. The landscape beds will be 4 feet wide by 200 feet long. Each bed will have a French drain in the center of the bed and the substrate will be an aged pine bark/sand mixture. The bed depth will be approximately 2 feet. Once the roses are planted, they will be drip irrigated, fertilized with a slow release fertilizer, and mulched with 3" of pine straw. Liquid fertilizer will be applied on an as-needed basis. Roses will be pruned in mid-February and early September. Weather and climate-related information will be recorded via the Louisiana Agronomic Information System. The information generated from the AGRS and ARTS programs and the AAS program will be published in the Botanic Gardens newsletter, LSU AgCenter Ornamental Update, Louisiana Nursery and Landscape Association Newsletter and presented at related industry meetings and conferences. Garden Fest at Burden, the annual Botanic Gardens field day features the AGRS and ARTS trials and program winners, as well as, the AAS trials and selected winners. American Garden Rose Selections (AGRS) Rose selections for the AGRS program are planted in February of each year. These roses are not treated with any chemical pesticides. Regional participants include the Northeast, Southeast, North Central, South Central, Northwest and Southwest. The LSU AgCenter Botanic Gardens at Burden is one of 12 AGRS trial sites in the US. Roses in the AGRS trials will be evaluated five times annually for disease resistance/susceptibility, plant vigor, foliage proportion and attractiveness, plant habit, flowering effect/bloom abundance, re-bloom habit, aging quality of blooms, cold and heat hardiness, flower fragrance, and general impression. Disease resistance (includes primarily blackspot and Cercospora leaf spot) will be evaluated on a scale from 1 - 10 with 1 = poor, 10 = excellent. Presence of powdery mildew, downy mildew and rust will also be recorded by simply rating plants as "resistant", "tolerant" or "susceptible". Vigor, foliage proportion and attractiveness, plant habit, flowering effect and bloom abundance, rebloom habit, aging quality of blooms, hardiness (cold or heat damage), general impression and fragrance will be rated on a 1-10 scale with 1 = poor and 10 = excellent. These data are submitted to the AGRS program coordinator and winners are selected based on combined data analyses from AGRS trials across the US. American Rose Trials for Sustainability (ARTS) Rose selections for the ARTS program will be planted in February of each year. These roses will not be treated with any chemical pesticides in the evaluations. The ARTS roses will be evaluated seven times annually. The major evaluation criteria include foliage ratings (retention, chlorosis, density, color, disease, and pests), form (growth habit, cane development, and cane thorniness), and flowers (bloom count, bloom coverage, fragrance, shade, size, color, color retention, spent petals, and calyces, hips). Minor evaluation criteria will be heat/cold tolerance and winter damage. Data are collected during the growing season at each of the trial sites throughout the U.S. The Botanic Gardens is one of two trial sites within its U.S. climate region as designated by the Köppen climatic classification system. This data is translated into a numerical point system. The average overall score for each variety in the trial is tabulated at each trial site and a regional score is determined by averaging the overall score for each variety at all the trial sites in a given climate region. The same process is done for the two control cultivars planted in the trial and the mean of the two control cultivars becomes the "standard" against which all roses in the trial are compared. Those cultivars who have a higher overall average score than this "standard" score for a region receive a local artist award for that region. If a rose is selected for a local artist award it is designated as an ARTS Master Rose in recognition of the wide range of adaptability. All America Selections (AAS) Trials Seeds or cuttings of AAS trial varieties of vegetables, herbaceous annuals and perennials will be evaluated based on the AAS evaluation criteria. The seeds will be sown to produce transplants for field planting in March. Plots will be

United States Department of Agriculture Project Initiation

approximately 20 feet long, with 30 inches spacing between rows, and covered with a black plastic row cover. All plants will receive liquid fertilizer (20-10-20) via a drip irrigation system on an as-needed basis. The soil is an Olivier silt loam soil that has been amended with coarse sand. Tomatoes and peppers will be staked as required for commercial production. Vegetables and herbaceous ornamentals will be judged on improved qualities such as earliness to bloom or harvest, disease or pest tolerance, novel colors or flavors, novel flower forms, total yield, the length of flowering or harvest and overall performance. Each entry is rated on a scale from 0 to 5 points, with 5 being the highest. These trials target small growers and home gardeners. Each year, 15 to 30 vegetable and ornamental varieties evaluated. The data collected will be forwarded to the AAS program headquarters. The scores are shared with the breeders. Based on the cumulative results of the judge's findings, the experimental variety will be named and released, or be continued for further development.