

IV. OBJECTIVES

There are four basic objectives for the revised S-103 project research for 1999-2004. These objectives have evolved out of the previous S-103 projects and relate not only to individual producers, retailers, and intermediaries, but also address the increasing maturity of green industry.

Objective 1. Evaluate alternative green industry plant production, establishment, and maintenance systems.

Objective 2. Evaluate the regional competitiveness within the green industry.

Objective 3. Evaluate the demand for green industry plants, materials, and services.

Objective 4. Evaluate the effectiveness of alternative merchandising techniques.

V. PROCEDURES

The procedures for the new project will emphasize the collaborative approach to address researchable problems confronting the rapidly expanding landscape (environmental) plant industry. The nation-wide membership of this research group provides an excellent means for researchers in states with similar production, marketing, or management problems to cooperate as a team. The production budget data, landscape/garden center data, and the sales data generated by the previous S-103 committee provide a base of knowledge that serves as a foundation for further work in these areas.

This committee is unique in its blend of economists and horticulturists, and this mixture of scientists enhances the realization of true interdisciplinary collaboration on research issues. As appropriate, the committee will continue to sponsor and support national and/or international symposia to serve the needs of scientists with an interest in the landscape(environmental) plant industry.

For each major research activity described for each objective, several committee members are identified who will provide leadership for that subcommittee's segment of the overall project. Other interested members of the research committee are encouraged to work with these subcommittee leaders. For instance, many states will participate in the consumer survey, but only a small subset will provide leadership in the questionnaire development and survey coordination. This approach permits the accomplishment of much more research since each committee member will provide leadership in one phase and benefit from others leadership in another phase.

Objective 1. Evaluate alternative green industry plant production, establishment and maintenance systems.

A. Evaluation of selected horticultural production practices (TX, PA, NJ, AL, GA, SC, MS, LA, RI, KY, NC, IL)

Objective leadership: McNiel. (Objective leaders serve as chair or co-chairs of subcommittees that been developed for the respective objective. They will provide oversight to the subcommittee to ensure regional collaborative efforts, and to coordinate publication efforts)

Horticulturists and agricultural economists from the states listed above will cooperate to evaluate the application of selected production efficiencies on the propagation, growth, and transplanting of field and container-grown landscape plants. Research will focus on irrigation water use efficiency, fertilizer formulations and uptake, bio-remediation of nursery and greenhouse fertilizer and

pesticide effluent, weed control, as well as environmental and chemical methods to improve or modify plant growth. The impact of growing methods on root growth configuration and its effect of transplanting will also be evaluated. It is anticipated that several regional publications will result from these efforts.

B. Determine economic feasibility of horticultural production systems (PA, TX, LA, KY, OH, FL)

Objective leadership: Hall, Hinson. (Objective leaders serve as chair or co-chairs of subcommittees that been developed for the respective objective. They will provide oversight to the subcommittee to ensure regional collaborative efforts, and to coordinate publication efforts)

Cost of production (COP) budgets at the grower and retailer level have also been an integral part of past S-103 activities. They provide a baseline for management's evaluation of a particular operation and for outside evaluation of firms by agencies such as lenders. COP budgets have been generated for the relevant plant groups, by plant hardiness zones (5 to 9) that are appropriate to participating states, and by container and field production methods. These are excellent references procedurally, and in terms of the management information they provide. They are, however, aging. The information they contain will be updated. Technologies of production continue to change, and these changes will be reflected as they are adopted by growers. Price relationships between productive inputs change. These budgets will be updated as appropriate.

Information transfer is another area where change has occurred. Most production nurseries have computer hardware. Software programs that are useful in generating COP budgets are easier to use. The internet is readily available in geographic areas of the US where plants are produced. The feasibility of disseminating the results of this research by putting these COP programs "online" in an interactive mode will be investigated as part of this project. It is also anticipated that regional publications (hardcopy and/or electronic versions) will result from these efforts.

C. Evaluation of selected plant establishment techniques (SC, TX, DE, AL, AR, OR, MS, LA, RI, IL).

Objective leadership: Eakes, Tilt (Objective leaders serve as chair or co-chairs of subcommittees that been developed for the respective objective. They will provide oversight to the subcommittee to ensure regional collaborative efforts, and to coordinate publication efforts)

Selected landscape installation techniques will be evaluated based on establishment success and time required. Establishment will be characterized using whole plant growth and physiological parameters. Regional conditions, such as soil type, amendment availability and temperature extremes will be considered. Production practices that affect establishment will be evaluated. Economic inputs required for installation and establishment will be developed. It is anticipated that regional publications (hardcopy and/or electronic versions) will result from these efforts.

D. Evaluation of landscape maintenance considerations (TX, SC, OR, MS, GA, IL, AL).

Objective leadership: Barton. (Objective leaders serve as chair or co-chairs of subcommittees that been developed for the respective objective. They will provide oversight to the subcommittee to ensure regional collaborative efforts, and to coordinate publication efforts)

Evaluating plants for highway right-of-ways - Native and naturalized plant material will be evaluated for use in rights-of-ways and roadsides. Evaluation will be based on adaptability, production procedures, establishment techniques, and maintenance requirements. Production and establishment costs will be determined to establish feasibility guidelines. Environmental considerations will be included in all decision-making recommendations.

A roadside vegetation project has been funded by the National Urban and Community Forestry Advisory Council in Delaware. The project will include four different planting treatments: (1) edit existing vegetation and add desirable native species, (2) cutback treatment with woody plants and herbaceous perennials and grasses in two cutback zones, (3) herbaceous perennials and grasses and (4) annual flowers seeded yearly. Researchers will monitor establishment procedures and costs; maintenance procedures and costs; environmental impacts; and public perception for each treatment. Results will be used to develop recommendations for highway vegetation managers.

Evaluating economic feasibility of plants for sustainability and reduced inputs - The economic impacts of modern agricultural practices in the green industry; the increasing reliance on non-renewable resources and reduced inputs in establishing, producing, and maintaining plant materials; and the effectiveness and efficiencies of sustainable agricultural technologies in evaluating the economic feasibility of alternative plant materials are concerns permeating the green industry. Procedural activities will include (a) the review of current establishment and maintenance recommendations and estimations of costs; (b) the determination of feasibility-risk-profitability trade-offs in using reduced inputs levels in establishment-production-maintenance regimes and economic feasibility analysis; and (c) the application of these models to evaluate plant materials with regard to productive effectiveness and economic efficiency in the landscape.

Objective 2. Evaluate the regional competitiveness within the green industry.

Objective leadership: Brooker. (Objective leaders serve as chair or co-chairs of subcommittees that been developed for the respective objective. They will provide oversight to the subcommittee to ensure regional collaborative efforts, and to coordinate publication efforts)

Data to support analysis of adjustments in marketing and management practices of wholesale and retail firms will continue to be obtained by mail survey techniques. In 1989 this research committee collected data from 23 states, which accounted for 75% of the U.S. total grower cash receipts. A second data set was obtained in 1994 with 24 participating states, representing 79 percent of the U.S. total. In states without representation on the S-103 committee, other horticulturist or agricultural economists worked with the S-103 committee on these surveys because of their desire to have the information collected. Also, data from a couple of key states were obtained with the help of the state's nursery association. All states with representation on the S-103 committee are anticipated to participate in this third nation-wide survey activity (AL, AR, FL, DE, GA, FL, IL, KY, LA, MI, MS, NC, NJ, OH, OR, PA, RI, SC, TN, and TX). It is anticipated that a regional publication similar to the previous two (hardcopy and electronic

versions) will result from these efforts.

Participating states will each use a common questionnaire soliciting information regarding management and marketing practices, production information, and detailed sales information regarding interstate movement of the product and the volume of business with various types of buyers. The third nation-wide survey by the S-103 committee will provide an important, unique cross sectional data set that will permit the evaluation of trends and/or structural adjustments occurring within the U.S. green industry. These three data sets will provide input for scientific investigation that is not available from any other source. While the intent will be to conduct the survey in every state, leadership will be provided by Brooker (TN), Hall (TX), Hinson (LA), McNeil (KY), and Turner (GA). Questionnaires will be distributed by a participant in each state, but all questionnaires will be returned to Tennessee for coding and preparation for analysis.

Another area to be examined is the relative size of the green industry within the U.S. economy and how it is linked to supporting industries. The approach taken is to use IMPLAN, an input-output model developed by the U.S. Forest Service. Research of this nature was published in 1995 (Turner and Kriesel) and will be updated during the course of this proposal. It is important that the green industry's contribution to agriculture and the economy be empirically documented.. Since data for this analysis is generated every five years, logic suggests that this research should be updated every five years also (FL, GA, LA, OH, and TN).

Objective 3. Evaluate the demand for green industry plants, materials, and services and how consumers evaluate their quality.

A. Investigate consumer preferences for plants characteristics and services (GA, DE, MI, IL, OH, AR, NC, KY, SC, TX, LA, TN, AL, FL, MS)

Objective leadership: Behe, Barton. (Objective leaders serve as chair or co-chairs of subcommittees that been developed for the respective objective. They will provide oversight to the subcommittee to ensure regional collaborative efforts, and to coordinate publication efforts)

The nursery industry is becoming more competitive and consumers are becoming more demanding. However, few studies have been conducted to determine the quality factors customers consider important and how it influences their purchase decisions. Moreover, little research has been conducted to examine the potential differences in assessments of product quality between plant professionals and consumers. The information generated in research studies will assist retail nursery professionals to better meet the needs of their customers.

Researchers plan to (1) ascertain the important quality factors and plant quality characteristics for a variety of woody plants and floriculture products, (2) identify the quality preferences of consumers and professionals, and (3) investigate the relationships between quality attributes and prices paid by customers. Results will assist growers and plant breeders focus on important quality attributes and provide input for development of grades and standards for the retail nursery industry.

Similarly, service quality affects customer satisfaction with the products they purchase and the retail outlets from which products are purchased. Studies will investigate consumer expectations and perceptions of service quality received from diverse retail outlets for horticultural products and

services. Information from these studies will assist businesses in quantifying the effectiveness of service programs and in defining a competitive advantage in the marketplace.

HRI provided a \$20,000 grant to study the increase in home value from different types of landscaping. A landscape architect prepared 12 landscape designs, representing 12 treatment combinations. Three plant sizes will be used to create 36 possible treatment combinations. Using the Conjoint design, 16 treatment combinations were chosen. Sixteen computer-generated photographs have been created to represent the 16 treatment combinations. A base plan with the house and turf only will be used for comparison. The photographs will be sent to each of eight participating states. Photographs will be mounted on foam core and displayed on easels (4 per easel). A survey instrument will be developed to ask participants what they would pay for each home and landscape combination. Researchers will conduct the survey in their own market at a local home show. The differences between the values for the base plan (home and turf only) and each treatment combination will be analyzed. Conjoint analysis will be used to determine the individual factors that impact consumer's decisions with regard to home values. It is anticipated that several regional publications will result from these efforts.

B. Analyze the demand for selected species and plant categories (NC, MI, DE, GA, MS)

Objective leadership: Turner, Safley. (Objective leaders serve as chair or co-chairs of subcommittees that been developed for the respective objective. They will provide oversight to the subcommittee to ensure regional collaborative efforts, and to coordinate publication efforts)

There is a dearth of information on the demand for plant material and nursery products. Given the dramatic growth of the horticulture industry, demand estimates are needed to help nursery professionals segment markets and more effectively target products and services. Most demand studies have provided useful information on the relative importance of various socioeconomic variables such as household income, number of single-family home construction starts, consumer education levels, and age composition of the population. However, few studies have taken into account the influence of prices on demand behavior. Collaborating researchers will conduct surveys at cooperating garden centers during the peak marketing seasons to determine the plant material consumers purchased, the prices they paid for the plants, and the demographic variables needed to estimate demand functions. A modified form of the Almost Ideal Demand Systems (AIDS) can then be used to estimate demand functions and the income and price elasticities for individual plants. These results can help marketers identify and target potential customers. It is anticipated that several regional publications will result from these efforts.

Objective 4. Evaluate the effectiveness of alternative marketing techniques.

A. Analyze the effectiveness of alternative methods of evaluating new plants, products, and services (MS, TX, AL, NC, DE, LA, FL, MI).

Objective leadership: Knight. (Objective leaders serve as chair or co-chairs of subcommittees that been developed for the respective objective. They will provide oversight to the subcommittee to ensure regional collaborative efforts, and to coordinate publication efforts)

Previous research conducted in garden centers investigated preferences for geraniums by asking the flower color, leaf variegation, and price combinations (viewed in photographs on display board) they would or would not purchase (NC, GA, AL, TX, DE). Red and lavender were the preferred colors, while zonal and plain were the most preferred leaf variegation, and low prices were preferred. A simulated blue geranium was not popular as it consistently ranked in the lower third of the preferred combinations. Conjoint analysis was used to identify important factors in the purchase decision.

This research framework is applicable to other plants, products, and services. One plan is to investigate the impact of statewide plant identification techniques (such as Georgia's Gold Medallion program) that focus on several plants. In other words, what economic impact does being identified with a particular promotional program have on product sales. It is anticipated that several regional publications (hardcopy and/or electronic versions) will result from these efforts.

B. Investigate alternative retail-level pricing schemes and displays (NC, DE, TX, GA).

Objective leadership: Safley, Barton. (Objective leaders serve as chair or co-chairs of subcommittees that been developed for the respective objective. They will provide oversight to the subcommittee to ensure regional collaborative efforts, and to coordinate publication efforts)

Pricing decisions and product displays are critical elements in the success of a business. While there are various strategies and methods managers can follow to set prices and display plants, there is limited research on the effect that varying prices and displays have on total sales. Researchers collaborating on this objective will recruit two to three garden centers in the same city to participate in two controlled in-store marketing tests. In the first test, identical plant displays will be set up and maintained for three to four weeks in the cooperating garden centers. A different price will be charged for the plant at each garden center. Prices will be changed at each store every Monday for the duration of the study. In the second study, the same price will be charged at each garden center, but the plant displays will be changed every week. Researchers will ensure that any advertising for the selected plant is comparable between cooperating garden centers to reduce any external bias.

C. Investigate the application of electronic marketing technologies (OH, TX, NC, DE, GA, TN, MS, LA, FL).

Objective leadership: Rhodus. (Objective leaders serve as chair or co-chairs of subcommittees that been developed for the respective objective. They will provide oversight to the subcommittee to ensure regional collaborative efforts, and to coordinate publication efforts)

Recent innovations in information technologies have brought the marketing of plants to the internet. Specific firms are incorporating CD-ROM technology, in conjunction with e-mail, to buyers to further increase the efficiency and convenience of their marketing programs. Research will focus on the adoption rate of this technology and what type of firm that is more likely to use computerized communication as an integral component in their overall marketing strategy. Data will be collected from the third nation-wide survey referred to under Objective 2. Analysis can be accomplished on a state by state basis and summarized at the national level.

D. Evaluate the effectiveness of retail-level advertising (NC, AR, GA, MS, LA, TX, TN, MI, FL).

Objective leadership: Safley, Haydu. (Objective leaders serve as chair or co-chairs of subcommittees that been developed for the respective objective. They will provide oversight to the subcommittee to ensure regional collaborative efforts, and to coordinate publication efforts)

Advertising is one of the fundamental tools for retail businesses. Its basic premise is straightforward: tell people who you are, where you are, what products and services you offer and why you offer a better value than your competitors. The immediate objective is to sell merchandise by increasing the number of shoppers and influencing them to buy more. The long-term objective is to develop continuity in the business's relationship with regular customers. Ongoing decisions for managers relate to which advertising media to invest in and how much to spend. However, most managers do not evaluate the effectiveness of their advertising and are not sure if their ads are having the desired results. Consequently, they are not able to adjust their ad programs from week to week or between marketing seasons.

Therefore, the overall purpose of this objective is to collect fundamental data about garden center advertising and promotional programs so managers can evaluate and improve their individual ad campaigns. Cooperating garden center managers will be asked to keep copies of their advertisements and commercials during peak marketing periods so researchers can analyze them for content and style. Researchers will survey customers at garden centers to determine if any of these advertisements prompted their visit to the store and the message within the ad that had the most impact on their shopping decision. Customers who were not influenced by an ad will be surveyed to find out if they can recall any of the advertisements promoting the business.

Other garden centers will be recruited to help evaluate the benefit of coupons. Cooperating managers will distribute coupons through their local newspapers, newspaper inserts, direct mail brochures or newsletters. Coupons can be redeemed for any product or for a specific plant. The number of redeemed coupons and the corresponding sales receipts will be recorded. This data will be compared to the sales receipts of those who did not redeem a coupon to help estimate the value of coupons in attracting customers and increasing sales. It is anticipated that regional publications (hardcopy and/or electronic versions) will result from these efforts.