The Green Industry Today—Some Issues and Future Prospects

Doyle C. Johnson and Robert L. Christensen

Abstract: *Green industry sales are projected to total $40.4 billion in 1994. The industry ranked sixth in 1991 among farm commodity groups in total cash receipts, and over the past decade total receipts increased 10 percent per year. Net income per farm is the highest of all the commodity groups. Nevertheless, the sector has received scant federal support compared to other commodities. In spite of growth and significance, economic analysis and data availability and reliability have been limited. There is clear justification for increased efforts in data collection and economic analysis of this industry's problems.*

Key Words and Phrases: *Green industry, Floriculture, Environmental horticulture, Greenhouse production and marketing, Turfgrass, Landscape plants.*

The "green industry" includes the production and marketing of floriculture and environmental horticulture crops.[1] It includes greenhouse and field-grown flowers and foliage plants, landscape plants, bulbs and turfgrass production. In many cases production is integrated with landscaping, florist and garden center operations. In part because of these marketing and service-related activities, greenhouse and nursery production contributes significantly to the economies of local communities. In fact, this sector has been found to generate the second highest net value-added per dollar of gross income among all agricultural commodities (Jinkins and Ahearn; Stanton et al.).

Total green industry expenditures (retail value of all product sales, domestic and imported, through consumers and business accounts, including sales of closely related accessories, excluding services such as landscaping) were projected to total $40.4 billion in 1994. This estimate was comprised of floriculture product expenditures of $14.3 billion and environmental horticulture of $26.1 billion (Johnson).

A recent survey of U.S. households reported that 17 million households spent $12.5 billion on professional landscaping and lawn care services in

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1993 (*American Nurseryman*). Of this total, lawn/landscape maintenance accounted for $6.4 billion, installation/construction $5.6 billion, and landscape design $381 million. The average household expenditure on landscape services was $721. The number of homeowners employing the services of landscape professionals grew 29 percent from 1992 to 1993 and was projected to increase by another 6 percent in 1994.

In 1991, grower receipts for floral, nursery and related products of $8.9 billion accounted for 11 percent of all farm crop cash receipts. The industry ranked sixth in 1991 among all commodity groups in total cash receipts and has been projected to rank third or fourth by the year 2000. Average cash receipts per farm in the nursery/greenhouse sector for 1993 is nearly $200,000. Net farm income per farm in 1990 was $53,589, the highest of all the commodity groups. Cotton ranked second with $42,396 and dairy third with $31,293 (Johnson; U.S. Department of Agriculture).

The focus of this article is on the production sector of the green industry with data drawn from the 1987 and 1992 *Census of Agriculture* reports. We will present some aggregate measures of the green industry and then provide additional detail concerning nursery crops, bedding and garden plants, potted flowering plants, potted foliage plants, cut flowers and cut cultivated greens, and sod production. We will not present data on bulb production, and "other" greenhouse and nursery products because data are not published for a number of states to avoid disclosure.

In the summary and discussion section we review some emerging industry issues, the lack of federal-state programs serving the industry, and support from public research and extension. We will especially note some of the problems and deficiencies inherent in the *Census* and U.S. Department of Agriculture (USDA) data series on the green industry.

The Green Industry—National Measures

The growth in this sector of U.S. agriculture has been unusually robust. Over the 1982 to 1992 decade, gross cash farm receipts from sales of greenhouse and nursery crops increased at a rate of 10 percent annually. In 1969, an estimated 18,000 farms, or 1 percent of all farms, were engaged in producing greenhouse and nursery products. By 1992, 47,425 farms were included in this sector. In 1969, farm level receipts from these farms accounted for about 2 percent of the U.S. total. By 1992, the sector was responsible for about 4.5 percent of total U.S. farm level cash receipts (Johnson; U.S. Department of Commerce, 1994).

Data from the 1992 *U.S. Census of Agriculture* describing the economic dimensions of the greenhouse and nursery industry is now available and allows comparisons with the 1987 *Census*. Table 1 contains aggregate estimates of numbers of farms, area under glass or other protection, area in the open, and sales by region compared to 1987. Aggregate greenhouse/nursery farm level cash receipts for the United States totaled $7.63 billion in 1992, up 32.2 percent from 1987. Nationally, the number of production units involved increased by 10,127 (27.2%) while the area under protection increased 16 percent and the acres in the open climbed 20.8 percent (U.S. Department of Commerce, 1989, 1994).

However, while numbers of farms and sales increased significantly in all regions there were differences in the growth rate between the regions. Increases in production units were least in the Northeast and greatest in the Southern region; 19.0 percent and 32.1 percent respectively. In terms of increases in sales by region, the Northeast region posted the lowest percentage increase (25.3%) while the North Central exhibited the greatest expansion (41.8%).

The sixteen states in the southern region, with 17,727 production units in 1992, accounted for 37.4 percent of the total. The region's $2.5 billion in sales also accounted for 33 percent of total U.S. greenhouse and nursery sales. The thirteen western states with 11,032 production units (23.3%) generated $2.6 billion in sales (34%). The remaining twenty-one states (39%) in the northeast and north central regions accounted for $2.5 billion in sales (33%).

Relative Importance of Crop Categories. Figure 1 presents 1992 sales for the different crop categories included in the floriculture and environmental horticulture business summary. The nursery crop category is the largest single category in terms of sales revenue ($2.6 billion) and accounts for slightly more than one-third (34.3%) of sales revenues. The nursery crop category includes trees and shrubs but excludes cut Christmas trees.

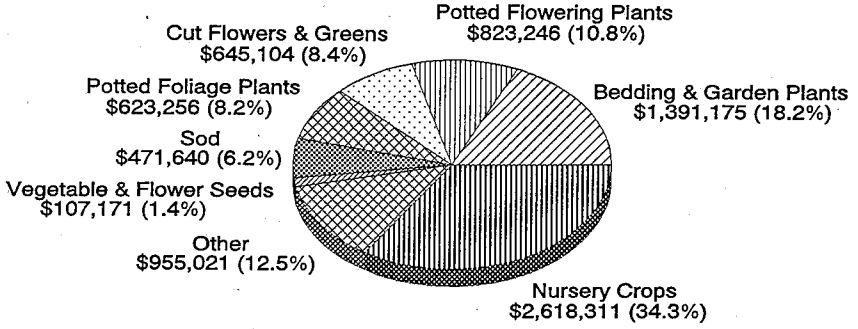
Bedding and garden plants, with nearly $1.4 billion in sales, ranked second among the crop categories and contributed about 18 percent of total sales revenues. Potted flowering plants accounted for about 10 percent of total revenues with sales of $823.2 million. Potted foliage plants (8.4% of sales) and cut flowers and greens (8.2% of sales) were next in importance. Turfgrass production (sod) generated nearly $472 million in sales in 1992 and contributed 6.2 percent of the total sales revenue. A collection of miscellaneous crops such as aquatics, decorative grasses, herbaceous plants, ground covers, plugs, lining-out stock, propagative materials, vegetable transplants, etc. comprise the remaining 12.5 percent and $955 million in sales.

Table 1.
Greenhouse and Nursery Crops by Region, 1987 and 1992[a]

Region	1987	1992	% Change
No. of Farms:			
Northeast	7,578	9,014	+18.9
North Central	7,365	9,652	+31.1
South	13,421	17,727	+32.1
West	8,934	11,032	+23.5
U.S.	37,298	47,425	+27.2
Area Under Glass or Other Protection *(million sq. ft.)*:			
Northeast	132.9	138.8	+4.4
North Central	121.2	144.9	+19.6
South	256.8	333.4	+29.8
West	242.1	266.8	+10.2
U.S.	762.0	883.9	+16.0
Acreage in the Open *(1,000 acres)*:			
Northeast	73.8	81.3	+10.3
North Central	115.0	147.9	+28.6
South	226.0	283.6	+25.5
West	164.2	186.8	+13.8
U.S.	579.0	699.6	+20.8
Sales *(million $)*:			
Northeast	974.1	1,220.7	+25.3
North Central	919.6	1,303.6	+41.8
South	1,850.0	2,506.8	+34.8
West	2,030.7	2,603.8	+28.2
U.S.	5,774.4	7,634.9	+32.2

[a]Includes cut flowers, cut florist greens, bedding plants, foliage and potted flowering plants, bulbs, mushrooms, nursery crops, sod, vegetable and flower seeds, greenhouse vegetables, and other greenhouse and nursery products.

Figure 1.
Relative Contribution to Total Greenhouse and Nursery Crop Sales Revenue of Individual Crop Categories, 1992



Relative Growth of Crop Categories in Sales Revenues. Some significant changes in sales of the several crop categories occurred from 1987 to 1992 (See Figure 2). All categories showed increases, but the 70 percent increase in sales of bedding and garden plants amounting to more than $500 million was easily the most significant change. Sales from vegetable and flower seed production increased 36.4 percent, but since this category only accounts for 1.4 percent of total sales, this growth is relatively insignificant.

Sales of nursery crops increased $627 million (31.5%) over the five-year period. Sales of potted flowering plants also grew 27 percent ($175 million). Sales of sod, cut flowers and greens, and potted foliage plants increased $80 million (20.4%), $50.6 million (8.5 percent), and $20 million (3.3%), respectively, over the five years.

Regional Comparisons by Type of Crop. Tables 2a and 2b contain data by region for nursery crops. For the United States as a whole, nearly 20,000 farms produced nursery stock and generated $2.6 billion in annual sales in 1992. Of these farms, 62.9 percent were located in the Southern and Western regions and those regions together accounted for 70 percent

Figure 2.
Growth in Greenhouse and Nursery Sales by Crop Category, 1987-1992

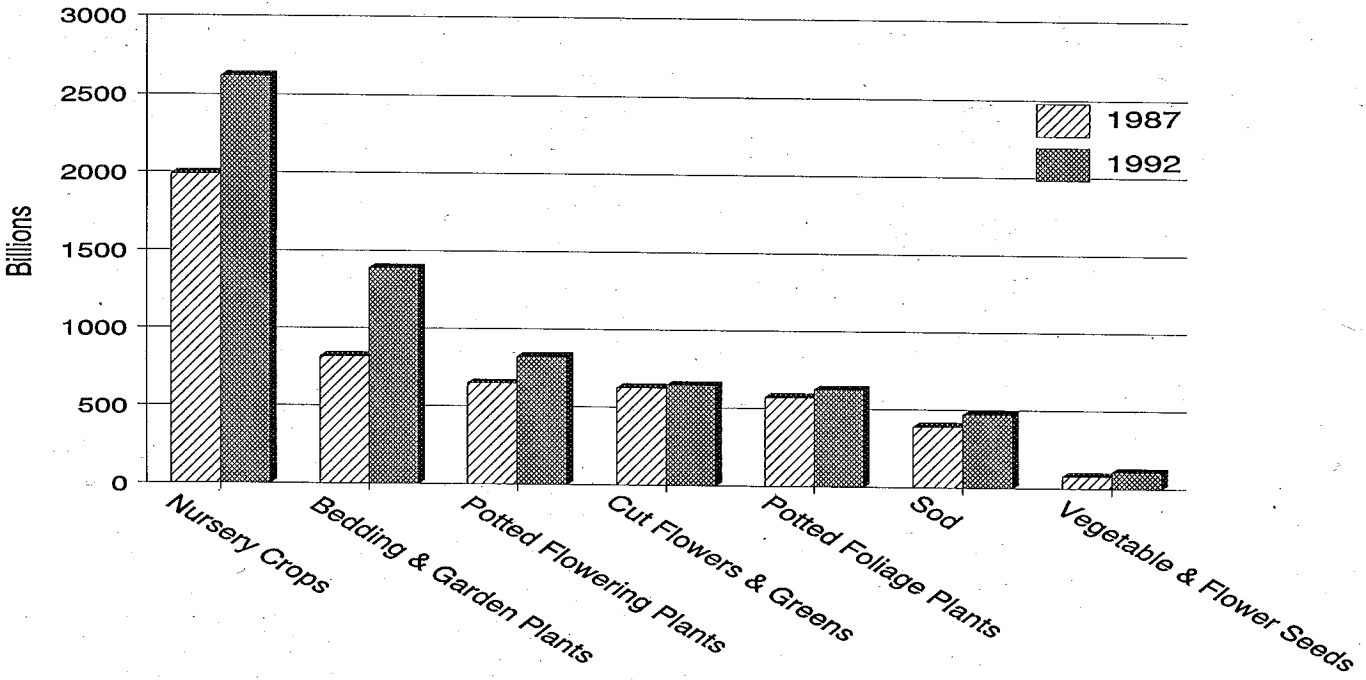


Table 2a.
Selected Greenhouse and Nursery Crops, by Region, 1992[a]

Region	No. of Farms	Area Under Glass	Acreage in the Open	Sales
		(mill. sq. ft.)	*(1,000 acres)*	*($1,000)*
Nursery crops:				
Northeast	3,507	17.7	62.1	341,013
North Central	3,887	13.4	83.2	444,435
South	8,416	52.0	126.7	918,086
West	4,120	44.6	59.4	914,777
U.S.	19,930	127.7	331.5	2,618,311
Potted foliage plants:				
Northeast	638	4.4	477	33,611
North Central	647	4.2	290	41,893
South	3,073	119.5	7,408	390,258
West	1,020	21.7	2,085	155,608
U.S.	5,383	151.0	10,418	623,256
Potted flowering plants:				
Northeast	1,908	25.9	1,194	163,914
North Central	1,736	30.0	858	182,403
South	2,578	48.9	1,751	270,200
West	1,253	33.6	735	184,275
U.S.	7,475	139.2	4,614	823,246
Bedding & garden plants:				
Northeast	4,180	44.2	1,511	227,874
North Central	4,158	75.4	1,873	374,296
South	4,640	66.8	4,720	406,890
West	1,894	41.8	5,200	376,367
U.S.	14,872	228.2	13,816	1,391,175

[a]Regional data may not add to U.S. totals because some state data are unpublished.

Table 2b.
Selected Greenhouse and Nursery Crops, by Region, 1992[a]

Region	No. of Farms	Area Under Glass	Acreage in the Open	Sales
		(mill. sq. ft.)	*(1,000 acres)*	*($1,000)*
Cut flowers & cut cultivated greens:				
Northeast	1,128	6.9	2,029	50,252
North Central	1,010	7.9	3,659	64,862
South	1,198	28.1	12,308	122,597
West	2,743	92.8	14,108	404,881
U.S.	6,065	137.5	32,258	645,104
Vegetable & flower seeds:				
Northeast	300	0.7	462	1,853
North Central	352	0.4	1,529	2,897
South	461	1.1	1,937	3,430
West	1,194	1.1	74,337	97,745
U.S.	2,307	3.6	78,296	107,171

[a]Regional data may not add to U.S. totals because some state data are unpublished.

of product sales. The southern region alone accounted for nearly 40 percent of nursery plant acreage in the open.

Table 2a provides similar data for production of potted foliage plants. These crops generated $623 million in sales in 1992. Some 4,093 of the 5,383 growers (76%) of these crops, were located in the southern and western regions of the United States.

Table 2a presents production and sales information on potted flowering plants. Nearly 7,500 growers were involved. However, the distribution of growers among the four regions was not dominated by the south and west as was the case for some other crops, although the south maintained its lead among the regions. Sales of potted flowering plants in 1992 totaled $823 million.

Table 2a contains the *Census* summary for bedding and garden plants. Nearly 15,000 growers reported sales of $1.39 billion of these products in 1992. The northeast, north central, and southern regions were approximate-

ly equal in terms of growers (4,180, 4,158, and 4,640 respectively), but the western region had somewhat less than half the number of growers counted in the other regions (1,894). At the same time, the western region's sales of bedding and garden plants was greater than either that of the northeast or north central regions.

Table 2b provides *Census* information on cut flowers and cut foliage greens. Some 6,000 farms generated $645 million in sales of these crops in 1992. The western region, with 45 percent of growers, had two-thirds of the area grown under glass or other protection, 42.7 percent of the acreage grown in the open, and accounted for about 63 percent of total sales of these crops.

Table 2b reports the data for vegetable and flower seed production. Again, the western region dominates with 51.8 percent of growers and 91 percent of 1992 sales totaling $107 million.

Table 3 summarizes the regional data for sod production. Here, the southern region with 47 percent of growers accounts for 57 percent of total sod acreage and 44 percent of sales value.

Summary and Discussion

Grower cash receipts to the nursery and greenhouse sector have expanded continuously for the past thirty years with only modest slowdowns during recessionary periods. Nursery/greenhouse crops now rank in the top five agricultural commodity groups in twenty-seven states. Growers whose principal production specialty is the nursery/greenhouse category have one of the highest net farm incomes of any commodity group in agriculture, in spite of the fact that they receive the least amount (about 0.12%) of all direct government payments.

Floriculture and environmental horticulture has been the fastest growing segment in U.S. agriculture over the past decade in terms of cash receipts. USDA data from the 1990 *Farm Costs and Returns Survey* showed that floriculture and environmental horticulture farms had the highest average net farm income of any agricultural commodity group at $53,589, compared to the average net farm income for all U.S. farms of $13,458 (Johnson and Johnson). Although floriculture and environmental horticulture farms are highly profitable, they are also risky and production intensive in the use of inputs and capital. Gross cash incomes for floriculture and environmental horticulture farms are generally higher than for other types of farms, but cash expenses are also higher.

Table 3.
Sod Production by Region, 1992[a]

Region	No. of Farms	No. of Acres	Sales
			($1,000)
Northeast	124	12,415	36,065
North Central	505	54,720	90,918
South	757	124,370	206,623
West	228	25,580	136,601
U.S.	1,614	218,161	471,640

[a]Regional data may not add to U.S. totals because some state data are unpublished.

Emerging Issues

From 1991 to 1993, more than 1,200 people from the green industry met in fifteen regional convocations and three national consensus meetings to discuss and prioritize research needs for florist, nursery and turfgrass agriculture. These meetings resulted in the definition of needs and the development of strategies and an implementation plan that would result in a legislative mandate for research to meet the needs of the industry. The six most critical research needs/issues identified were:

1. Economics. Development of a comprehensive data base to identify the size, scope, employment and products of the "green industries."

2. Environment. Research on methods of retrofitting and building growing facilities to meet the anticipated environmental standards.

3. Export. Information to identify the pests, procedures and the protection of intellectual rights to bolster exportation of domestically grown floral and nursery products.

4. Employment. Investigations into people-plant interactions to enable the industry can provide plants, services and professional opportunities for all.

5. Excellence. Research into safe pest control measures in the face of waning availability and desirability of chemical pesticides to ensure product excellence.

6. Education. Research to insure that all handlers of the products of the "green industries," from breeder/propagator to the ultimate consumer, are provided the best information on the care, benefits and favorable environmental effects of plants.

Nine goals were identified that called for research on factors to improve plant quality, develop integrated production systems, improve plant health and performance, enhance efficiency of production, improve plant safety, develop production and marketing methods that meet consumer needs, and identify production systems that are sensitive to environmental quality goals. For a more complete background on research needs and priorities see Cathey.

The Green Industry Data Base

The economic analysis and statistical data availability for the green industry, particularly for nursery crops, continues to be very deficient and was noted as a major issue in the consensus meeting described in the previous section. This deficiency arises because: 1) federal/state programs to support growers of green industry crops are generally lacking, 2) no unified political voice for the green industry exists, and 3) there is a general, pervasive belief that since nursery and greenhouse crops are not food or fiber, they are not a part of agriculture.

The lack of support is exemplified by the fact that the decennial 1988 *Census of Horticultural Specialties* was only partially completed due to lack of funding. The Census Bureau then summarized the partially completed survey from about 70 percent of growers accounting for about 55 percent of sales (U.S. Department of Commerce, 1991). This situation results in serious questions with respect to the validity and reliability of that report. More specifically, it suggests the possibility of major underestimation.

There are also questions concerning the estimates provided by the 1992 *Census of Agriculture* and, therefore, the kinds of aggregate totals reported earlier in this paper. We believe the 1992 *Census of Agriculture* figures for greenhouse and nursery crops (especially the latter) may be underestimated at best for the following reasons:

1. Reliable universe lists of growers do not exist, largely because of the general lack of farm programs that serve the nursery/greenhouse grower (universe lists for the *Agricultural Census* are dependent to large degree on participant lists provided by USDA service agencies).

2. A substantial number of retail nurseries and wholesalers that have greenhouse/nursery production facilities and/or field-grown nursery stock file tax returns as a retailing or wholesaling business and not as a "farm" and therefore are not identified by the Census Bureau as an agricultural operation.

3. Due to the fact that the USDA does not conduct a national nursery producer survey, and the 1988 *Census of Horticultural Specialties* was incomplete, universe list updates for "nursery/ greenhouse" producers probably were less than complete for purposes of the 1992 *Census of Agriculture*.

4. There has been a rapid increase nationally in the numbers of horticulture growers since 1987. Although some of this increase may be attributable to new entrants to agriculture, there is evidence that a large share of this increase is due to grower diversification as horticultural crops are included in the crop mix by producers who have previously concentrated in production of traditional agricultural commodities.

5. Cross-checks, or comparisons of *Census* data for the nursery/greenhouse crops with other data sources (such as USDA, state departments of agriculture, and university and industry surveys), suggest there may be significant deficiencies in the *Census* estimates. For example: Some industry experts believe plug, cuttings, liners, and other young plant sales exceed several hundred million dollars annually while the *Census* estimates only $42 million for this category. Also, the *incomplete* 1988 *Horticulture Census* shows $190 million in unfinished plant sales (cuttings, liners, plug seedlings, tissue culture, plantlets, etc.) which casts further doubt on the accuracy of the $42 million *Census* estimate.

Research Needs. It should be noted that only 0.02 percent of federal agricultural research dollars are directed to the problems of this sector of agriculture (Johnson and Johnson). This relative neglect in terms of

government support constitutes a major barrier to the future growth and prosperity of the U.S. green industry.

Compared to other agricultural commodities, research on the economics of this sector has been modest in quantity and scope, and extension educational programs in business management and marketing have likewise been limited in availability. It is clear that the floriculture and environmental horticulture sector of agriculture is of sufficient importance to justify expanded resources and activity in economic research and extension programs to support and enhance this growing agricultural industry.

Notes

Doyle C. Johnson is an Agricultural Economist with the Economic Research Service—USDA, and Robert L. Christensen is a Professor, Department of Resource Economics, University of Massachusetts, Amherst. The views expressed in this paper are those of the authors and do not necessarily reflect those of either institution.

1. "Floriculture" includes cut flowers, cut florist greens, potted foliage plants and bedding/garden plants; including plugs and other greenhouse plants. "Environmental Horticulture" crops include turfgrass, nursery plants, and related products (such as trees, shrubs, ground covers, bulbs, fruit/nut plants, and seedlings and other young plants) and exclude cut Christmas trees, seed crops and greenhouse vegetables.

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