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Adjustments in Market Channels and Labor in the Florida Sod Industry

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Before World War II, sod came from ranches or dairy operations where farmers planted 'Common' St. Augustinegrass for pasture as a secondary farm enterprise. At that time, production was adequate to serve a market limited largely to a few homeowners and private businesses. Since then, the sod industry has grown rapidly to meet the demand brought on by the state's urban population explosion. In addition to homes, apartments and condominiums, today's new markets include resorts, golf courses, schools, and parks. In 1987 the industry consisted of 137 farms with 49,952 acres in production with a value exceeding \$72 million. This figure represented nearly one-fifth of all sod sold in the U.S. that year. By comparison, Texas was the second largest producing state with production estimated at 16,911 acres and sales of \$20.6 million in 1987 (Johnson).

One factor that influences the effectiveness of an industry to satisfy markets is the best use of labor, including creating the right balance between machinery and labor to attain optimal output. Labor needs vary with the enterprise and the types of technology available. For agriculture in general, the process of increased farm mechanization has resulted in the substitution of capital equipment for labor (Cochrane). A second important element is the effectiveness of market channels in getting the final product to the end user. There are a succession of stages through which a commodity must pass in the production and marketing process. How well managers coordinate these stages to deliver the product demanded at the right time and place are indicators of overall system efficiency (Marion).

This paper examines changes in labor use and market channels for the sod production industry. The paper compares how production and distribution have evolved differently from other sectors in agriculture. Finally, we suggest reasons for the differences which have developed.

Data

We used data from two comprehensive surveys of Florida's sod production industry. Brewster completed and published the first study in 1965. The second provided

current information to University of Florida specialists working with the industry and focused on both agronomic and economic issues (Cisar et al.).

We examined the 1965 and 1987 studies to identify variables amenable to inter-temporal comparisons. Therefore, we included only variables that were similarly defined and measured. Each survey sought to interview the entire population of growers. In each case, the primary method of identifying potential respondents was to get lists of sod producers from trade associations. The 1965 study used a personal interview approach and the 1987 study used questionnaires mailed to the growers. Response rates were good with returns exceeding 60 percent for each study.

Background on Market Channels

We can define channel of distribution as an organized network of agencies and institutions which, in combination, perform all the activities required to link producers and users to accomplish the marketing task (Boone and Johnson). From a seller's point of view, the channel permits him to find and supply users of his goods. From a buyer's viewpoint, the channel finds and delivers the goods or services desired. Marketing channels perform a crucial role as a basic component in a firm's marketing strategy. Delivering a product to consumers at the right place, at the right time, and in the right amounts is essential to successful selling. Thus, marketing channels must not be a static network but rather must change in response to changing economic conditions. The following three propositions, amended from Boone and Johnson, help explain the formation and structure of these outlets within the context of sod production.

1. *The characteristics of the product are determined by marketing channels.* Perishable goods impose a need for quick and careful handling. In this view, the best channel is one that minimizes the cost imposed by the product's characteristics. For sod, heavy weight and high perishability are two such characteristics that influence the distribution mechanism.
2. *The channel is more than simply an agency for the physical distribution of goods.* Distribution involves more than just the flow of goods, but also includes: a) the flow of ownership and control through which moves the authority to decide what shall be done with the goods; b) the flow of information for what is wanted and available to buy or sell, and; c) the flow of money through which capital is assembled and brought into the marketing process which enables buyers to pay sellers.
3. *The producer alone does not dictate the structure, form, and effectiveness of the channel.* There are multiple participants between producer and end user, each of whom will influence the form of the channel. That form which satisfies all participants will tend to persist and dominate.

Marketing Channels

Empirically, the effects of these three propositions have shaped and changed the distribution channels for Florida's sod industry. Figure 1 shows a conceptual illustration. Since 1965, the most notable change in the industry's channel structure has been a decline in percentage sales to retail and landscape outlets (Table 1). Brokers or wholesalers who function as middlemen between producers and the final consumer had, by 1987, become an important intermediate outlet for the flow of cut sod. In 1965, retail outlets accounted for 97 percent of total sales. However, by 1987, this outlet accounted for only 70 percent of total sales (Table 1). This finding is particularly salient in that it is contrary to recent market developments in other areas of agriculture. For instance, Haydu (1988) found that many large farm operators were increasingly circumventing market intermediaries and selling directly to buyers. Rather than sell grain to marketing firms, the largest farmers were negotiating the exchange arrangements and shipping direct to grain elevators. The underlying incentive for this behavior was the cost savings to the buyer in avoiding a value-added step in the distribution process. Sod producers, however, face a different set of circumstances and conditions. Using a farm size comparison illustrates these special conditions.

For the three largest categories, market channel use shifted appreciably towards more indirect sales (Table 1). In Figure 1, rather than sell directly to retail outlets or landscape firms, sales to brokers and wholesalers has risen markedly. However, percentage changes within a category provide little insight into the overall shifts in channel use. For instance, although medium size growers nearly doubled their use of

Figure 1:
Market Outlets and Channels for Florida Sod

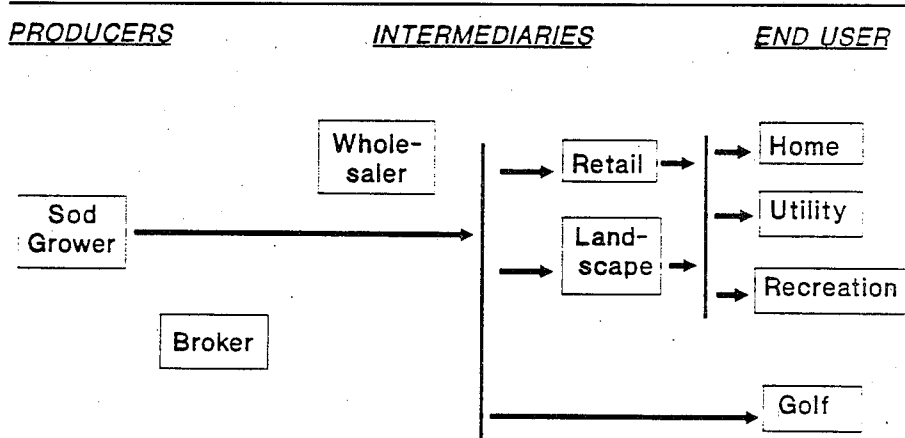


Table 1.

Changes in Market Channel Use and Average Sales by Different Farm Size Categories and 1987

Farm size ^a	Sample size		Market outlets				Average per	
	(N)		Brokers/wholesale		Retail/landscape		farm sales	
	1965	1987	1965	1987	1965	1987	1965	1987
			----- percent -----				----- acres -----	
Small	29	18	3	9	97	90	60	131
Medium	4	11	21	50	79	50	150	181
Large	5	9	0	21	100	79	302	711
Very large	5	8	0	28	100	72	697	2,706
All growers	43	46	3	30	97	70	146	936

a. Farm size in acres (1963): small (0-114); medium (115-206); large (207-274); very large (275+). Farm size (1987): small (0-499); medium (500-999); Large (1,000-1,999); very large (2000+).

indirect outlets, their impact was relatively minor since they represented only 10 percent of total sales in 1987. By contrast, large and very large farms had 85 percent of sales, with the latter group representing roughly two-thirds of the total. Thus, with average per farm sales exceeding 2,700 acres for the largest producer, a 30 percent increase in sales to an alternative outlet had a greater significance than did a similar increase in a medium-sized operation (Table 1).

This use of indirect sales, particularly by the larger producers, signified an important industry trend toward specialization of tasks. Three factors, one demographic, one economic, and one biological, aided to this shift in the use of market outlets. First, Florida began to experience a surge in its population as retirees from the Northeast and Midwest began immigrating in large numbers. Many service industries soon flourished, which provided additional incentive for people to immigrate. From 1970 to 1989, Florida's population grew from 5.1 million to 12.8 million. This represented a net growth of roughly 1,000 people per day (Florida Statistical Abstract). Population growth, therefore, served as a demand-pull mechanism for future economic growth.

New housing starts, and with it the landscape contracting sector, expanded to meet this impressive growth. This became the second factor that reshaped the market outlets for sod. The landscape sector grew both by numbers and size of operations. From only several hundred landscape firms in the early 1960's, the industry grew to nearly 4,000 by 1988 (Florida Statistical Abstract). An economy of size in housing developments resulted in extremely large tracts. In turn, these large tracts required large quantities of sod for landscaping purposes. The sod production industry adapted to this new environment by altering its own structure dramatically.

Since 1965, the largest farm size has increased from a little over 1,100 acres to nearly 5,000 acres (Cisar et al.).

Finally, the highly perishable nature of harvested sod also contributed to this shift away from sales to the retail sector by the largest growers. Once cut, sod must be laid and irrigated within 24 to 48 hours. The time factor is largely a function of the sod's original quality, handling conditions, and the local air temperature. Since the upper limit is only two days, an efficient distribution system is necessary. Hence, it is likely that the very large farmers found it more economical and less risky to permit independent shippers to handle their distributional transactions. Another aspect is that large producers simply outgrew their capacity to meet demand at the smaller retail level. As firm size grew, their comparative advantage shifted increasingly to sod production and away from distribution.

On the other hand, smaller producers have clearly set up their own market niche serving the many smaller landscape contractors and retail firms that predominate within the industry. Farmers in the smallest size category still have the greatest proportion of their sod shipped directly to retail outlets. They also rely heavily on company owned trucks to deliver their sod. Moreover, rather than specialize, some small farmers vertically integrated their firms to supplement farm income. A movement towards operational diversity serves to offset this group's inability to benefit from the economies of size realized by much larger producers.

Farm Labor

A phenomenon common to U.S. agriculture has been a decline in the number of farm operators, from 3.9 million in 1960 to 2.1 million in 1987 (U.S. Department of Commerce). We can attribute this to pull-and-release factors that affect the flow and distribution of farm labor. The nonfarm sector exerts the pull through increased demand for labor. The release mechanism is the labor-saving technology in the farm sector. The labor-saving and output-increasing farm technology made larger-scale farms more feasible and profitable. We can see the results of release-and-pull factors in changes over time in the index of farm inputs and its components. Although the total index of inputs used in farm production has not changed much from 1917 to 1970, major shifts occurred in the composition of inputs. The index of farm labor decreased from 223 in 1917 to 64 in 1969. At the same time the index of mechanical power and machinery increased from 28 in 1917 to 115 in 1969 (Johnson and Quance). It is within the context of this out-migration of labor in the farm sector that we now discuss labor in the cut sod industry.

Between 1965 and 1987, permanent workers per farm increased in all size groups except very large farmers (Table 2). The number of seasonal workers also increased except small farms. Growers of bahiagrass and very large St. Augustinegrass producers accounted for the reduction in the permanent labor force. The cut sod subsector experienced a labor trend contrary to the general agricultural sector, and even from

Table 2.

Permanent and Seasonal Labor Use in Sod Production for 1965 and 1987

Farm size ^a	Year/labor type					
	1965			1987		
	Permanent	Seasonal	Total	Permanent	Seasonal	Total
	-----average number/farm-----					
Small	4	6	10	7	5	12
Medium	6	2	8	17	4	21
Large	13	4	17	27	16	43
Very large	46	8	54	38	13	51

a. Farm size, in acres (1963): small (0-114); medium (115-206); large (207-274); very large (275+). Farm size (1987): small (0-499); medium (500-999); large (1,000-1,999); very large (2,000+).

more comparably aligned sectors. For instance, five years ago growers harvested 70 percent of Florida sugarcane by hand, the last production activity not mechanized. Today manual harvest accounts for only 30 percent and there is a clear movement to end hand labor entirely within the next few years (Alvarez, Polopolous). We can explain this phenomenon by the nature of the tasks involved in sod production and with the labor market found in Florida. Some of the largest sod producers have claimed that current farm equipment is not cost effective, nor can it handle large volume jobs. Large labor teams can cut, stack, and move sod more quickly than automatic harvesters. In addition, continued heavy use of farm labor may also be due to the unique labor market to which these operators have access. Political instability in many Caribbean and Latin American countries, along with Florida's strategic geographic location and diversified agriculture, have insured a steady supply of capable, low-cost labor. This is particularly true for the larger farms located in the southern portion of the state. A second related point is that labor offers more working flexibility. Since many workers are seasonal, the farm does not incur an annualized cost of production, as with of machinery. Once bought, harvesting equipment becomes part of a firm's fixed costs. Thus, even when the equipment is not in use, the owner is still paying for it. On the other hand, growers employed seasonal labor, as a variable cost of production, only when needed. Under current labor market conditions and within certain farm sizes, the marginal value product of labor (the net benefit obtained from one additional unit of an input) could well exceed that of machinery, which would explain the sod industry's incentive for increased use of hand labor.

Although hired labor remains an important factor of production, another gross efficiency measure is to compare changes in the average number of acres under production with changes in the average number of employees. A labor-to-land (N/L) ratio shows these results. Lower ratios indicate greater overall efficiency in the management of a farm. We calculated these ratios from the data in Tables 1 and 2 for the

two periods 1965 and 1987. In both periods the smallest farm size category was less efficient than the three larger ones (1965—Small N/L = 0.17, Medium 0.05, Large 0.06, Very Large 0.08; 1987—Small N/L = 0.09, Medium 0.04, Large 0.06, Very Large 0.02). Secondly, labor efficiency improved considerably during this period, particularly for the smallest and largest farm sizes. When examining the average acreage under production on a per laborer basis, the most efficient farm size in 1987 was the very large farm (Table 3). This finding differs from the 1965 study in which Brewster found large farm size most labor efficient. However, differences in grass varieties grown influenced these results. Ninety percent of grass produced by the largest farms was bahiagrass, a low labor intensity, low-valued crop in comparison to St. Augustinegrass.

Table 3.

Acres in Production as a Function of the Permanent Labor Force, 1987

Farm size	Grass type		Total
	St. Augustine	Bahia	
	----- average acres/person -----		
Small (0-499 acres)	48	31	35
Medium (500-999 acres)	41	250	64
Large (1,000-1,999 acres)	51	282	141
Very large (2,000+ acres)	116	1,174	645
Total average	64	434	221

Conclusions

There have been important changes in Florida's cut sod industry in the past 27 years. First, the sod industry has shown an ability to adapt to a rapidly changing environment, providing adequate supplies of sod despite unprecedented increases in demand. One result of this demand is that the size of individual firms have grown. The two largest size categories harvested ninety percent of all sod in 1987.

Secondly, the distributional mechanisms of this industry are evolving differently from systems elsewhere in agriculture. For instance, many of the largest producers of food and fiber commodities have begun by-passing market intermediaries and selling directly to the buyers. The incentive for this behavior is the cost savings realized by circumventing market intermediaries. The sod industry, on the other hand, appears to have moved in the opposite direction. Large producers in particular are relying increasingly on market intermediaries to sell and distribute their product. Specialization of tasks, both in the production and distribution of sod, may be a growing trend in this industry.

Finally, trends in labor use have changed differently from most agriculture commodity areas. In the past 50 years there has been a pronounced substitution of

capital for labor throughout the farm sector in general. This has resulted in significant declines in the number of farm operators. Yet despite increased labor-saving technology in the cut sod subsector, the use of both permanent and hired labor on a farm unit basis has actually increased in the past two decades. We can attribute this development to the unique labor market found in Florida where, because of abundant supplies of cost-effective labor, many farm operators find this a preferred management choice.

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