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A COST AND LABOR SURVEY OF 18-HOLE GOLF
COURSES AROUND THE KANSAS CITY AREA

by

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B.S., KANSAS STATE UNIVERSITY, 1973

A MASTER'S REPORT

submitted in partial fulfillment of the

requirements for the degree

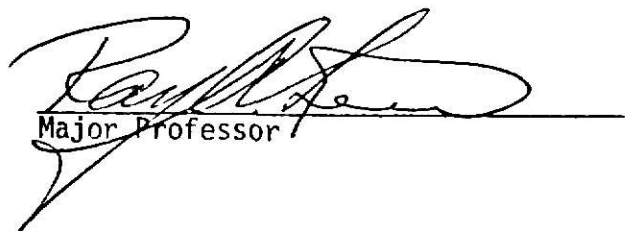
MASTER OF SCIENCE

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INTRODUCTION

The golf courses of America have some of the most beautiful landscapes in the country. The cost of maintaining these courses has risen dramatically with inflation, sometimes to the point that many have to reconsider spending the considerable sums of money necessary to maintain quality. From interviews with golf course superintendents of the Kansas City and central Missouri area, a survey was conducted on the total costs and the man-hours spent on greens, tees, and fairways. The superintendent's yearly budgets are compiled and the average of all the golf course budgets is compared to a projected budget for the national average 18-hole golf course.

In conclusion, some ideas are presented that have helped some superintendents to improve their efficiency in managing their golf courses.

METHODS AND PROCEDURES

The data for this report were obtained from interviews with Golf Course Superintendents concerning their yearly budgets. Nine 18-hole courses, one 9-hole course, and one 27-hole course were surveyed. The 27-hole course maintained 9-holes for duffers at a minimum level. The budgets of these two courses balanced each other. The courses surveyed were located in the Kansas City and central Missouri area. The superintendents were asked about the maintenance and man-hours

spent on greens, tees, and fairways. No attempt was made to include traps, natural hazards, or roughs. The areas were examined with respect to number of times per year an operation is performed and the hours spent performing each task. The five major divisions of the survey were mowing, watering, renovation, pest control programs, and fertilizing practices.

The superintendents were then asked about annual budget. In compiling the data from the budgets, fourteen divisions were used. Not all budgets included allocations for all fourteen categories. Results are based on averages of figures received. Finally, the superintendents were asked to respond to the question, "If your annual budget was cut by 25 percent, where would you make your adjustments?"

All values and averages are based on the operation of an 18-hole golf course. Some operations may or may not be relevant to all golf courses. The mean of the total costs and man-hours spent on greens, tees, and fairways have been averaged for the eleven golf courses. Total hours are based on a 40-hour week and a 9-month season.

RESULTS

From the survey of the Golf Course Superintendents, the results were averaged and tabulated for the average golf course in the surveyed area. (Table 1.)

Of the time spent on the average golf course for maintenance, 9,002.83 man-hours were spent on maintaining the greens, tees, and fairways. The time spent on watering included some courses with automatic irrigation, and some courses that had to be watered manually.

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Table 1. Average Man-Hours Per 18-Hole Golf Courses

| Operation | | Greens | Tees | Fairways |
|--------------|------------------|----------|---------|----------|
| Mow | times/yr. | 212.4 | 122.4 | 111.6 |
| | hours/yr. | 1,062.0 | 648.0 | 808.8 |
| | % total hrs. | 11.8 | 7.0 | 8.98 |
| Water | hours/yr. | 2,844.0 | 810.0 | 1,854.0 |
| | % total hrs. | 31.59 | 9.0 | 20.59 |
| Spike | times/yr. | 36.0 | 0.7 | 0.0 |
| | hours/yr. | 165.6 | 4.2 | 0.0 |
| | % total hrs. | 1.84 | 0.05 | 0.0 |
| Aerify | times/yr. | 1.8 | 0.0 | 2.6 |
| | hours/yr. | 77.6 | 0.0 | 97.1 |
| | % total hrs. | 0.86 | 0.0 | 1.08 |
| Topdress | times/yr. | 1.8 | 0.0 | 0.0 |
| | hours/yr. | 92.1 | 0.0 | 0.0 |
| | % total hrs. | 1.02 | 0.0 | 0.0 |
| Fertilize | times/yr. | 7.2 | 4.2 | 2.7 |
| | hours/yr. | 41.0 | 19.9 | 25.1 |
| | % total hrs. | 0.46 | 0.22 | 0.29 |
| Herbicides | times/yr. | 1.4 | 1.5 | 1.3 |
| | hours/yr. | 10.78 | 4.5 | 33.9 |
| | % total hrs. | 0.12 | 0.05 | 0.38 |
| Insecticides | times/yr. | 18.0 | 9.0 | 8.0 |
| | hours/yr. | 122.4 | 27.0 | 72.0 |
| | % total hrs. | 1.36 | 0.3 | 0.8 |
| Fungicides | times/yr. | 28.8 | 0.0 | 10.5 |
| | hours/yr. | 167.04 | 0.0 | 15.75 |
| | % total hrs. | 1.86 | 0.0 | 0.17 |
| Totals | hours | 4,582.58 | 1,513.6 | 2,906.65 |
| | percent of total | 50.9 | 16.81 | 32.29 |

The fungicide applications on the fairways were usually of a curative nature. The greens received regular fungicide applications.

The fertilizer rates vary according to the soil conditions and the species of grass being grown. All the golf courses surveyed had some variety of bentgrass on the greens. Eight courses had zoysiagrass tees. Three of these eight courses also had some tees of perennial ryegrass. Of the two courses that had bluegrass tees, one also had a mixture of Game ryegrass mixed with the bluegrass. One course had bentgrass tees.

The fairways consisted of one or more of the following grasses: bluegrass, ryegrass, zoysiagrass, or bentgrass. Four courses had zoysia fairways. Of these four, one also had some fairways of bentgrass and some of bluegrass. Six other golf courses had bluegrass on all their fairways. Four of these six used ryegrass mixed with the bluegrass. With each kind of grass grown, the superintendent must adjust the fertilizer rate to fit the playing area and the existing conditions of the turf. The maximum, minimum, and average fertilizer rates are given in Table 2.

The average budget of the golf courses surveyed was surprisingly close to the national average as projected for 1974 by the Sixth Annual Golf Industry Marketing and Research Report in Golfdom. (2).

Other items that are included in the annual budget for the Kansas City Area are in Table 4.

The golf course budgets ranged from a high of \$140,000/yr. to a low of \$79,498/yr., on the 18-hole courses. The average annual budget of the courses surveyed was \$114,464 per year. The cost of labor is the primary expense of all the courses. The average cost is \$57,545

Table 2. Maximum, Minimum, & Average Fertilizer Rates
Annual Pounds of Nutrients Per 1,000 Sq. Ft.

| | Greens | | | Tees | | | Fairways | | |
|-------------------------|--------|------|------|------|------|------|----------|------|------|
| | max. | min. | avg. | max. | min. | avg. | max. | min. | avg. |
| Nitrogen (N) | 10 | 4 | 6.81 | 10 | 0 | 3.81 | 10 | 0 | 4.5 |
| Phosphorus (P_2O_5) | 4 | 0 | 1.36 | 3 | 0 | 1.12 | 3 | 0 | 1.38 |
| Potassium (K_2O) | 6 | 0 | 3.5 | 6 | 0 | 1.5 | 2 | 0 | 1.05 |

Table 3. Projected 1974 Golf Course Budget v.s. Average
Kansas City Course Budget Expenditures

| | 1974 Projected National Average | Kansas City Area Average |
|-------------------------|--|--------------------------------|
| Labor | \$57,100 | \$57,545 |
| Pesticides | 4,720 | 5,625 |
| Fertilizer | 5,400 | 5,193 |
| Seed | 1,600 | 2,410 |
| Capital Improvements | 14,300 | 4,566 |
| TOTAL | \$83,120 | \$75,339 |

Table 4. Other Kansas City Area Expenditures and the Average Total

| | |
|--------------------------------|---------------|
| Maintenance and Repair | \$ 10,148 |
| Water | 13,000 |
| Miscellaneous | 8,508 |
| Gas | 2,888 |
| Utilities | 2,433 |
| Association Dues & Conventions | 988 |
| Rental | 760 |
| Telephone | 400 |
| TOTAL (Plus Table 3) | \$114,464 |

per year, ranging from a high of \$80,000, to a low of \$30,000 per year. The average cost of labor consumed 50.3 percent of the average total budget.

In the responses of the superintendents to the question of reducing their budgets, the most frequent responses were to reduce labor and fertilizer. Fertilization only consumed 4.5 percent of the average budget, and accounted for only 86 man-hours per season. However, cutting back fertilizer is an indirect way of reducing labor since rapid growth requires more care. For example, mowing consumes a total of 2,512.8 man-hours per season. This is 28.18 percent of the total time.

In an effort to cut back the cost of operations on the greens, tees, and fairways, the superintendents suggested that less mowing be

done, less water be applied and less chemicals be used. They implied that chemicals should be used at curative rather than at preventative rates. One positive solution was to mechanize the operation more by increasing the number and/or quality of the machines.

Most superintendents agreed that there was very little possibility of economizing on the greens, tees, and fairways, and maintain the quality of play. The roughs would be the areas first sacrificed to reduce funding. Less mowing of the roughs, reduced trimming around the trees, along with less attention to water, fences, and other structures could reduce expenditures. Care of the trees, shrubs, and traps may be less frequent.

The value of using growth retardants was asked of several superintendents. All agreed that there was very little opportunity to use them on the major play areas. A popular idea was to use them on grass that would receive little if any traffic. Such areas would be around trees, water, structures and other obstacles in the roughs. The retardants could cut back on the time spent on trimming.

All the suggestions of the superintendents were aimed at reducing the cost of labor by cutting back the labor required to perform any given task. John Van Dam (7) suggests that the owners of the golf course must first decide if they want better care for the same amount of money, or the same care at a lower cost. Once this has been decided, the superintendent should lead the way to increasing the efficiency and economizing operations by adopting a system of unit cost determination. This idea is becoming more and more popular. Dr. James Watson (9) and James A. Fischer (1) have both stressed that becoming a better business manager and keeping accurate records is becoming more important in the business of running a golf course.

By following the guidelines of Fischer (1) in setting up an accounting system one can better account for each dollar. First, use standard record forms for collecting and summarizing the cost data. Second, develop a pathway to present the data to key people. If done properly, the superintendent can keep records of man-hours, machine-hours, methods and procedures. From these data one can tell where economy or efficiency can be improved. Van Dam (7) points out that accurate records of when, how, and what was done can be helpful in case of a dispute. Written records can be helpful in calculating cost, projecting future budgets, and substantiating the cost of buying new equipment, or repairing the old.

Fischer (1) suggests that buying new, more efficient equipment will cut down labor cost in the long run. The initial cost of the equipment can be absorbed in a shorter time than one would expect.

A possible alternative to the high cost of buying equipment is to rent or lease the needed machinery. One course in the Kansas City area has some of its fertilizer applied by a contractor. The superintendent saves both money and man-hours. By contracting the fertilizing of fairways, the job is accomplished with a minimum of interference to the players. Leasing has several advantages such as conservation of capital. When renting is properly adopted, the tax advantages will allow less cash outlay and the working capital is increased. In fact, leasing might be a step in fighting inflation by reducing capital spent on purchasing equipment. Limitations in the budget may be overcome by leasing. Renting or leasing offers some flexibility in acquiring necessary equipment.

The next step in upgrading the defficiency of a course is to make the crew more conscious of the condition of the equipment. Thomas (6) suggested training the members of the crew to report any parts that are missing, wearing out, or emitting unusual sounds. The crew should tighten loose nuts, bolts, and screws before they are lost. Make sure the operators know how to maintain the machinery with proper adjustments and how to preform correct lubrication. Clean machinery will usually run longer and better than dirty machinery. The superintendent should make sure that the goal of the mechanic is to cure and prevent problems not only replace lost parts.

The use of area maintenance was not in use on the courses surveyed. However some of the superintendents were interested in its possibilities. Area crew maintenance has a great potential for keeping all the little details under control. Things like trimming around trees, traps, and structures, and raking traps can be watched closer by someone in charge of that area, than by one person for the entire course. This especially holds true for larger courses. The amount of work that each crew is responsible for will vary on each course. In any case, the division of labor should free the superintendent from assigning many trivial jobs. Watson (8) reported that by dividing the course up into several equal areas, the crews on each area would compete with each other to see who had the best looking area. The productivity of the crews increased 24-30 percent without an increase in the number of men. Promoting pride in the crew can pay positive dividends.

Several superintendents were asked about the use or ornamentals on their golf courses. Many had tried to use flowers but had little success with them. Some of the beds were established with the understanding

that the superintendent would put the beds in and the club members, usually the garden club, would take care of the flowers. For flowers to be functional, the superintendent should plan on planting the flowers and taking care of them all season. Alexander M. Radko (5) and Holman M. Griffin (3) both point out the valuable asset that flowers can play. First, flower beds and ornamental plantings offer a touch of quality to a golf course. When visitors and guests come to a course their first impression is what remains with them. The flowers and landscape are a definite drawing point to a golf course. In addition to being attractive, the flower beds may be functional as well. Placing gardens along cart paths and walks not only improves appearance, but will help to direct traffic and prevent dirt paths from forming. In other areas ornamentals can be used to reduce glare, control erosion, and screen noises and views. Overall, plantings may reduce maintenance requirements. Proper planning may also use plants to frame a particularly scenic view from the club house or pro-shop.

Care of flower beds may not be as expensive as might be expected. Radko (5) points out that by using a straw mulch, weeds can be controlled with a minimum of effort and expense. The mulch will also act as a natural compost the next year. Some golf courses may be equipped with greenhouse facilities, but this is not essential. Planting stock can be acquired from a commercial propagator. Ordering early will help assure that the flowers will arrive at the proper planting time. It is well to consider any problems that might be associated with the plant materials that are ordered. Items like leaf fall, roots in sewers, cones, nuts, berries, shadows, and design quality should be taken into account before planning any permanent plantings.

Another idea for planting would be to use native plants. Stanley E. Metsker (4) reported that if the existing plants are not removed then they do not have to be replaced. Indigenous plants may also be the easiest to care for, as well as appearing natural in their setting.

As in most businesses the cost of labor is the main expense in the annual budget. If a superintendent is interested in economizing, it stands to reason that the first place to cut back would be labor. The roughs and hazards would be reduced before the greens, tees, and fairways. If a course wishes to maintain the present quality and not sacrifice the roughs, then improving efficiency would be the next step. By reducing the man-hours required to perform a task, the superintendent saves money. Better equipment or more carefully thought out process may help to improve efficiency.

As fast as the price of operating a course seems to be going up, saving money may not be practical except in the sense that economizing on one operation may help finance another project.

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APPENDIX
MASTER'S REPORT SURVEY

GREENS

Mow

Times/Week

Time to mow all greens

Height

Irrigation

Duration of application

Gal./Min.

How to water all greens

Renovation

lbs. of Seed

Species

lbs. of top dress mix

Times spiked/year

How long

Times aerated/year

How long

Times top dress/year

How long

Pest

Weeds

Control program

Insects

Control program

Diseases

Control program

Fertilizer

N

P

K

Total rate for greens

How often/year

TEES

Mow

Times/Week

Height

Total time to mow

| | | |
|--------------------------------|---|-----------------|
| Irrigation | | |
| Duration of application | | Gal./Min. |
| Total time to water | | |
| Renovation | | |
| Total lbs. of seed | | Species |
| Pest | | |
| Weeds | | Control program |
| Insects | | Control program |
| Diseases | | Control program |
| Fertilizer | | |
| N | P | K |
| Total lbs. for tees | | |
| How often | | |
| FAIRWAYS | | |
| Mow | | |
| Times/Week | | Height |
| Time to mow all fairways | | |
| Irrigation | | |
| Duration of application | | Gal./Min. |
| How long to water all fairways | | |
| Renovation | | |
| lbs. of seed | | Species |
| Times spiked/year | | |
| Total time to spike | | |
| Pest | | |
| Weeds | | Control program |
| Insects | | Control program |
| Disease | | Control program |
| Fertilizer | | |
| N | P | K |
| Total lbs. for fairways | | |
| How often/year | | |

GENERAL EXPENDITURES

Labor salaries

Repairs & Maintenance

Sprays

Fertilizers

Seed

Water

Miscellaneous

Others

Total Expenditures

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ABSTRACT

Interviews were conducted with golf course superintendents from the Kansas City and central Missouri area to determine the amount of time spent on managing greens, tees, and fairways, and total yearly golf course budgets.

Of the total annual time of 9,109 man-hours, 50.3 percent or 4,583 man-hours were spent on grooming greens. The tees received 16.6 percent or 1,514 man-hours. Finally, the fairways got 33.1 percent or 3,013 man-hours per growing season.

The average total annual budget for a 18-hole golf course was \$114,724.00 per year. Labor accounted for 50.1 percent of the total budget. The other 49.9 percent is divided among thirteen categories. When the superintendents were asked where spending priorities would be changed, most indicated labor would be the logical place to initiate economies.