been involved in the disease. If one or more of these species of **Helminthosporium** were involved, however, the conditions favorable for infection and/or disease development were not easily reproduced.

White grub worms and plant parasitic nematodes have been found associated with spring dead spot also but not with sufficient regularity to be considered as primary causal agents. When either or both of these agents were associated with the disease they probably only enhanced the damage already done.

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WAYNE ALLEN CALLED TO ACTIVE MILITARY SERVICE

W. Wayne Allen, agronomist, who has served for two years in the USGA Green Section's Southwestern Office, began a tour of active military duty on October 15. Mr. Allen is a member of the 49th Armored Division which was one of the two divisions called up for the purpose of strengthening our nation's active military force. He has been granted a military leave of absence and it is expected that he will return to the Green Section staff upon completion of his tour of duty.

Why Keep Records?

By MARVIN H. FERGUSON
Mid-Continent Director, and National Research Coordinator, USGA Green Section

The most obvious reason for a golf course superintendent to keep records is that of enabling him to account to the members of his club for **their** money which he has expended in the process of maintaining **their** golf course. This alone is reason enough for adequate records. It is the club's property. It is their money. The members have a right to know how their money was spent and what was accomplished through its expenditure.

There are many additional dividends to be gained from the keeping of adequate records. Good records help the superintendent to gauge the effectiveness of his operations, to accurately estimate costs of future work, to prepare a sound budget, to be able to predict machinery and equipment replacement needs, to evaluate the performance of men and equipment, and to compare maintenance costs with others (on a valid basis).

Measuring Effectiveness of Work Done

The turf around trees near tees and alongside fairways has been nicely trimmed and provides a pleasing appearance. Most club members like it that way and usually no questions are asked. But suppose an economy-minded member inquires about the cost of this trimming. He is entitled to know. Can you give him the answer?

There is some evidence of grub damage on fairways. This damage will not be excessive but it could be cleared up completely with an application of a soil insecticide. Is it worth the cost of treatment now or should the operation be postponed until next year? How much will it cost for materials and for application? The answer to the first question must be based upon one's budget position and the attitude of his club with respect to standard of maintenance. It is a question of judgment. The second question is one of fact, however, and can be answered rather precisely on the basis of records kept in the past.

Grass in fairways is growing rapidly. Clippings are so heavy they are lying on top of the turf. They are unsightly and they stick to one's shoes when they are wet with dew. Why have these clippings become so heavy? Has rainfall been heavier than normal? Has the night irrigation man been spending more time than usual on the fairways? How much fertilizer was applied? When? Good records will provide this information and perhaps give a clue to the factors contributing to the excessive growth.

There is excessive **Poa annua** in the collars of greens—more than in other years. Could a weed control treatment, which eliminated some existing vegetation, have coincided with the period of **Poa annua** germination? Or was there a

severe disease attack which thinned the bent at a critical period? Records may reveal the reason for the excessive **Poa annua.** Memories often are so faulty as to be unreliable in one's efforts to recall dates and events of such a nature.

Frequently, the Green Section agronomist asks a superintendent a question such as, "When did you last apply insecticide for sod webworm control?" The answer may be, "Oh, about 3 weeks ago." Upon checking records it is frequently found that the elapsed time is much greater. Memories just cannot be completely trusted during a busy, hectic season. Only a written record which can be referred to during a less busy season can be the basis for an analysis of the effectiveness of one's activities.

Estimate Costs of Future Work

Records of labor and material requirements for routine operations permit precise estimates of costs of performing this or similar work in the future. Suppose, for instance, that a club wishes to establish a different grass on fairways. During the golfing season it may be possible to maintain bluegrass satisfactorily with two mowings per week, whereas, bermudagrass which requires closer cutting and which grows during the summer months may require four mowings per week. How much more time will be required? Will presently owned mowing equipment be sufficient to take care of the problem? Will a new tractor be needed?

It may be decided that fairways should be aerified more frequently, that flagstick positions be changed twice daily, that sand traps be raked more frequently, that divots in tees be repaired and topdressed daily, or that new towels on ball washers be replaced more frequently. Conversely, it may be proposed that only the putting green should be sprayed with fungicide and that fringe areas be skipped in order to save money. The superintendent with complete facts at hand can answer all such proposals intelligently. He can predict the amount of savings in the latter case and perhaps forestall a decision that would prove to be false economy. In the case of increasing the frequency of some maintenance operations, he can accurately estimate the increased costs and committee members may not wish to provide this amount of money for the improved conditions.

Budget Planning

It is virtually impossible to plan intelligently and accurately a budget for a future year's operations unless records of former operations are available. Labor costs may change, but experience in other years with respect to labor requirements by hours are helpful in figuring costs. Thus, hours required multiplied by current or foreseeable labor costs will provide a very accurate prediction for budget purposes.

A budget which is prepared realistically should take into account the depreciation rates of equipment. A budget item for equipment replacement should be inserted annually so that major items of capital expense are spread over a number of years rather than being shown on a single year's budget. It is distressing to find that some clubs not only fail to provide for depreciation but do not have an up-to-date inventory which shows the remaining useful life and estimated value of equipment owned. Costs of supplies can be estimated with fair accuracy by studying the invoices or purchase orders from past years. In the case of fungicides and insecticides it is well to maintain a supply of materials on hands even though sizable quantities must be carried from one year's inventory to the next. More accurate estimates of material needs may be made by referring to records of weather conditions, disease incidence, severity of insect attacks, etc. If quantities of materials used can be related to the conditions prevailing during the season, such information is more valuable than a total figure which simply expresses costs of materials used.

Comparing Costs

It has been said frequently that comparisons between golf courses cannot be made. Regardless of the validity of the statement, comparisons will continue to be made. If records are accurate and detailed, some comparisons are possible and in some cases they may be helpful.

For instance, two clubs may compare the average time required for mowing an acre of fairway or to rake 1000 square feet of sand trap or to cultivate 1000 square feet of putting green. It may be helpful to know that a seven unit gang mower allows one superintendent to easily mow his fairways three times a

week with one tractor, whereas his neighbor, operating with a five unit gang cannot get over his golf course in the same length of time.

Finding Maintenance Weaknesses

It is frequently the case that the membership of a club is not overly critical of the conditions existing on a golf course. While superintendents may dream of this kind of membership, it is not a good situation because without the benefit of golfers' criticism and comment, a superintendent may fall into a maintenance routine that neglects some feature of the course.

Recently one superintendent found in going over his records that he had spent hardly anything for tee repair, ball washers, and towels. His records immediately revealed to him a matter that he had overlooked on the course and one about which his players had not complained. He immediately undertook a program of regularly servicing ball washers and repairing tees. This situation may seem unusual, but it happens more frequently than most of us realize. It is often difficult to see ourselves. When records can help reveal such weaknesses they perform a real service.

Kinds of Records

Records systems may be simple or complicated and they may consume little or much time. The dislike of a complicated, time-consuming system has deterred many from keeping anything like complete records.

The simplest and most desirable is a daily diary. If routine operations as well as special jobs are recorded and weather conditions noted, this diary together with payroll records and invoices for materials purchased will provide the basic information needed by the superintendent.

Because of the fact that records hold a fascination for many people, it is easy to progress to certain other types of records that will provide useful information.

The illustrations and their explanations indicate some of the types of information that will provide a complete and detailed history of the year's operations on any golf course.

Complete records do require a considerable amount of time. Those who have kept such records feel that they are well worth the trouble and time. They enable the superintendent to subject his operations to a constant, critical analysis. He can spot his weaknesses, he can precisely predict next year's costs, he can defend those maintenance tasks he believes to be important, he can recommend the elimination of costly course features which he believes to be unimportant, and finally, he can demonstrate his responsibility to the club by showing his membership exactly what he has done **for them** with **their money.**

WORKMAN'S DAILY TIME SHEET

Form 1

Name_____ Date_____

Hrs.	Operation	Hrs.	Operation
	GREENS ___Mowing ___Poling ___Irrigating ___Change cups ___Fertilizing ___Cultivating ___Vert. mowing ___Topdressing ___Spraying ___Other **GREEN COLLARS** ___Mowing ___Irrigating ___Fertilizing ___Spraying ___Cultivating ___Other **GREEN APRONS** ___Mowing ___Irrigating ___Cultivating ___Spraying ___Fertilizing ___Other **FAIRWAYS** ___Mowing ___Irrigating ___Fertilizing ___Cultivating ___Spraying ___Other **TEES** ___Mowing ___Irrigating ___Fertilizing ___Repair ___Cultivating ___Spraying ___Ball washers ___Other **TEE SLOPES** ___Mowing ___Irrigating ___Fertilizing ___Spraying ___Cultivating ___Other		**ROUGH** ___Mowing ___Trimming ___Weed control ___Other **WOODLAND** ___Brush control ___Tree care ___Mowing ___Other **SWAMPLAND or BOG** ___Drainage ___Weed control ___Other **NURSERY - Grass:** ___Planting ___Mowing ___Trimming ___Spraying ___Irrigating ___Fertilizing ___Other **NURSERY - Trees, etc.** ___Planting ___Spraying ___Irrigating ___Fertilizing ___Cultivating ___Other **WATER HAZARDS** ___Trimming ___Weed control ___Other **BUNKERS - Sand:** ___Raking ___Weed control ___Trimming & Edging ___Other **BUNKERS - Grass:** ___Mowing ___Other **MISC. MAINT.** ___Equipment ___Roads ___Service Bldgs. ___Benches, shelters ___Other

FORM 1: A daily time sheet for the individual workman. Each workman should check the items on which he has worked during the day and record the hours in the appropriate column. Where the work does not fit any of the categories listed, the workman should check "Other" and make an explanatory note somewhere on the sheet. This form should be turned in daily to the superintendent.

Form 2

MONTHLY SUMMARY SHEET

Month of_____ 19____

OPERATION	NO. OF TIMES PERFORMED	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	TOTAL HOURS
GREENS																																	
Mowing																																	
Poling																																	
Irrigating																																	
Change Cups																																	
Fertilizing																																	
Cultivating																																	
Vert. Mowing																																	
Topdressing																																	
Spraying																																	
Other																																	
GREEN COLLARS																																	
Mowing																																	
Irrigating																																	
Fertilizing																																	
Spraying																																	
Cultivating																																	
Other																																	
GREEN APRONS																																	
Mowing																																	
Irrigating																																	
Cultivating																																	
Spraying																																	
Fertilizing																																	
Other																																	
FAIRWAYS																																	
Mowing																																	
Irrigating																																	
Fertilizing																																	
Cultivating																																	
Spraying																																	
Other																																	
TEES																																	
Mowing																																	
Irrigating																																	

FORM 2: A summary sheet for the transfer of the information given on daily time tickets. The superintendent should use this summary sheet to make a daily record of the total hours spent on each phase of maintenance. At the end of each month, the daily entries may be totaled to provide a monthly summary of the time consumed by every operation.

Form 4

SUMMARY SHEET — COST OF SUPPLIES PURCHASED

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	TOTAL
Gasoline													
Oil													
Grease													
Fertilizer													
Seed													
Stolons													
Fungicide													
Herbicide													
Insecticide													
Sand													
Peat													
Miscellaneous													
TOTALS													

FORM 4: A summary sheet showing supplies purchased. This information should be drawn from invoices or purchase orders. These data, together with year end inventories, will provide figures on supplies used and their value.

Form 3

BASIC DATA

Course Description:

1. Total acreage:
2. Fairways — Acres.....
3. Rough — Acres.....
4. Woodland — Acres.....
5. Swampland or Bog — Acres.....
6. Nursery area — Description & size
7. Putting green .....1000 sq. ft. units
8. Collar .....1000 sq. ft. units
9. Apron .....1000 sq. ft. units
10. Water hazards .....1000 sq. ft. units & description
11. Bunkers (sand) .....1000 sq. ft. units
12. Bunkers (grass).....1000 sq. ft. units
13. Tees .....1000 sq. ft. units
14. Tee slopes .....1000 sq. ft. units

FORM 3: A basic sheet which will serve as a description of the course with respect to the areas subject to various categories of maintenance. Units of maintenance will be derived from this information. We have found that aerial photos made to scale (obtainable from nearly all local Soil Conservation Service offices) are extremely useful for determining areas. A planimeter can be used to obtain fast and accurate measurements of area from these photos.

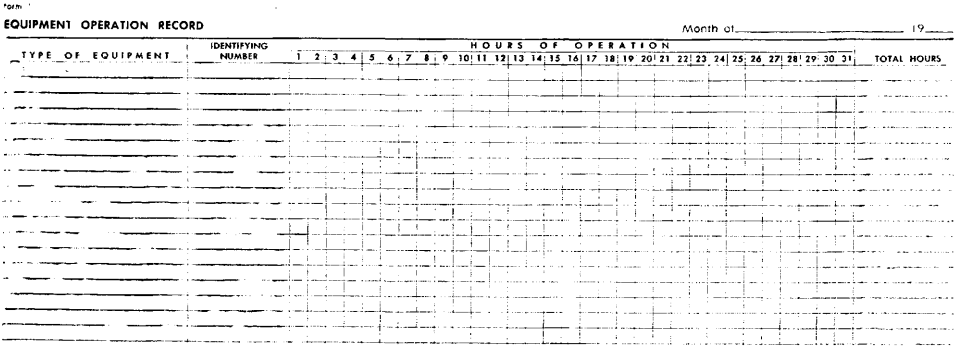
Form 5

SUMMARY SHEET — MACHINERY MAINTENANCE COSTS

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	TOTAL
Parts													
Golf Course Labor													
Outside Repairs													
Other													
TOTAL													

These costs to be derived from invoices and from daily time records.

FORM 5: A summary sheet of equipment and maintenance costs. If the club maintains a "repair parts" inventory, this must be considered in determining the cost of repair parts used.


Form

EQUIPMENT OPERATION RECORD

Month of..... 19....

TYPE OF EQUIPMENT	IDENTIFYING NUMBER	HOURS OF OPERATION 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	TOTAL HOURS

FORM 7: An equipment operation record. This should show the item of equipment, an identifying number, and a record of its operation. This record usually is the responsibility of the superintendent, though he may pass the responsibility to the operator of the equipment. This record will have no value from the standpoint of maintenance costs, but it will be helpful in establishing "'expected useful life" of equipment.

Form 6

INVENTORY OF EQUIPMENT

TYPE OF EQUIPMENT	Identifying No.	(a) Estimated Value	(b) Estimated Remaining Useful Life Years	(a) ÷ (b) Annual Depreciation

FORM 6: An inventory of equipment. This should show each item of equipment owned by the club, an identifying number, its estimated value, its estimated useful remaining life, and the annual rate of depreciation. Small items, such as hand tools, should be placed on a separate inventory. A budget item usually takes care of replacement needs of such "expendable" items.

Form 2a

WEEKLY PAYROLL SHEET

For Week of_____, 19____

WORKMAN'S NAME	DATE S	M	T	W	Th	F	S	HOURS REGULAR PAY	RATE PER HOUR	TOTAL REGULAR PAY	HOURS OVER-TIME	OVER-TIME RATE	TOTAL OVERTIME PAY	TOTAL EARNINGS	DEDUCTIONS	NET PAY

FORM 2a: A weekly payroll form. On this form each workman's time for each working day is recorded, (this also is transferred from the daily time sheet Form 1). Form 2a provides a record of the total hours of labor for each man, his rate of pay, his total earnings, net pay and the totals of these items for the entire crew.

COMING EVENTS

November 16-17
Arizona Turfgrass Conference
University of Arizona
Tucson, Arizona

November 27-30
Fifty-Fourth Annual Meeting of
American Society of Agronomy
Sheraton-Jefferson Hotel
St. Louis, Missouri

December 5-6
16th Annual Oklahoma Turfgrass
Conference
Student Union Building
Oklahoma State University
Stillwater, Okla.

December 11-12-13
16th Annual Texas Turfgrass Conference
Memorial Student Center
Texas A. & M. College
College Station, Texas

December 11-14
Weed Society of America
Sheraton-Jefferson Hotel
St. Louis, Missouri

1962

January 26
USGA Green Section Educational
Program
Biltmore Hotel
New York, N. Y.

January 28-February 2
33rd International Turfgrass Conference
and Show
Golf Course Superintendents Association
of America
Deauville Hotel
Miami Beach, Florida

February 19-22
Penn State Turfgrass Conference
The Pennsylvania State University
University Park, Pa.