

ANOTHER VIEW

LIGHTWEIGHT MOWING OF GOLF COURSE FAIRWAYS

RANSOM CORP.

Lightweight mowing of golf course fairways has been one of the most controversial subjects raised at recent golf superintendents meetings. Most superintendents are waiting to see more evidence on the benefits of lightweight mowing before considering a change. Although there is certainly no consensus in favor of lightweight mowing, the number of courses switching is significant. The topic certainly deserves further review.

When discussing lightweight mowing, one is usually referring to five or three reel unit mowers in which the cutting units are an integral part of the tractor. This is contrasted with the seven reel unit which can often be attached to an independent tractor. The small three gang units (triplexes) will weigh as little as 700 pounds, the five gang units will weigh approximately 3000 pounds while the independent tractor units may exceed 6000 pounds. With a range of lightweight units weighing from 700 pounds to 3000 pounds, the superintendent obviously has a larger decision confronting him than only whether to convert to lightweight fairway mowing. He must also decide how light.

To obtain a better understanding of this movement to lightweight mowing, information was gathered from conversations with superintendents in various parts of the country who have adopted these methods. Although the information does not offer an absolute answer to the argument, it may help us to understand the pro's and con's of the method.

Our information indicates that the main areas of the continent concerned with lightweight mowing and/or the picking up of fairway clippings are those with cool seasons although compaction on fairways can certainly be a

problem on any golf course. Specifically, great interest in lightweight mowing can be found in the Midwest, some Eastern states, the Pacific Northwest, Southern Ontario and Quebec. A major portion of the playing surface on the courses in these areas contains *Poa annua* grass. Since the grass is shallow rooted, the high temperatures and low rainfall of the summer months often cause a summer 'wilt'. It is believed that lightweight mowing reduces compaction on fairways enabling the grass to develop a better root structure allowing greater resistance to this 'wilt'. It is also believed that the removal of clippings further aids the resistance by reducing a build-up on 'grass insulation'. This insulation helps retain the summer heat which can be detrimental to the grass.

In the Pacific Northwest, where high amounts of rainfall cause the fairways to become soft and more likely to be damaged by heavy machinery, the use of lightweight equipment appears an obvious choice.

Further elaborating on the benefits of lightweight mowing as presented by the superintendents:

1. REDUCED TURF DAMAGE/ COMPACTION

Since the small triplex unit can weigh one-ninth that of the heavy tractor units, compaction is substantially reduced. Even the use of the five gang, which can weigh one-half that of the tractor unit, will reduce compaction. The smaller units will also reduce turf damage in undulating fairways because of their inherent ability to follow the terrain more closely. In addition, the smaller units have power drive to the reels which do not rely on draw bar pull as do ground drive or trailing type and thus the tractor drive wheels are less likely to 'spin out' on a slope or in a wet spot.

2. PRECISE MOWING/CLEANER CUT

The power driven reel can be speeded up or slowed down to obtain the clip rate required for the job. They can usually be reversed for back-

lapping, to insure the blades are sharp at all times. The units are narrower because the drive wheels are eliminated and so the mowers can go down into the hollows and yet not scalp over the mounds. One word of warning however, not all machines have a floating head which limits them to the smoother or level style of fairway. A floating head is one which follows the contours of the ground independent of frame work or the position of the tractor unit.

3. ABILITY TO MOW IN DIFFERENT DIRECTIONS/ CROSS MOWING

The smaller unit is more maneuverable and can cut against the 'grain' which is caused by only cutting in one or two directions. Cross mowing helps the grass stand upright and insures the same length thereby eliminating the unfair lie in the middle of the fairway.

4. ABILITY TO COLLECT CLIPPINGS DURING THE MOWING OPERATION

Some lightweight machines can be fitted with grass catchers or baskets. Clipping removal is said to lower the temperature of the ground surface by eliminating the 'silage effect', (the decomposition of the clippings which generate heat) relieving stress during periods of high temperatures. Collecting clippings also removes the *Poa annua* seed heads, which over a period of time may reduce the *Poa* and increase bent grass which, due to its better root structure, is more tolerant to heat.

Several superintendents who pick up clippings have reported that they have found it unnecessary to syringe when clubs around them have. In addition, they report that the population of bent grass has increased significantly.

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5. SMALLER MACHINE/LESS CONSPICUOUS

The smaller units are less of a nuisance to the golfer and it is possible to work closer to him or get out of his way faster enabling the work to carry on without "too much" effect on his game.

6. ASTHETIC APPEAL

The striping effect from the narrower cutting machine is very noticeable and as the golfer stands on the tee, it gives him an idea of what he is up against. Definition of undulations or curves are more pronounced and this may add to the game.

7. UTILITY OF ONE MACHINE TO PERFORM SEVERAL FUNCTIONS

Since some lightweight machines can be utilized for cutting tees, green aprons and clubhouse grounds besides fairways, two additional advantages have been realized. Most significantly, fewer types of mowers need be purchased and maintained. Second, the idle transport time of a unit is reduced. Several superintendents commented that the smaller units can get between two points quicker since their size allows them to bypass obstacles the independent tractor units must travel around.

The biggest apprehension regarding the use of lightweight mowers is the cost. Since many items which relate to cost vary with each course, the biggest arguments have been in this area. Looking at a hypothetical situation with the listed assumptions, we see some insignificant cost differences except when disposing of clippings.

ASSUMPTIONS:

Acres cut per year — 30 acres of fairways cut 75 times per year for a total of 2250 acres.

Fuel cost — \$1.20 per gallon.

Depreciation — Seven years for independent tractor units. Seven years for five gang units. Four years for three gang units.

Time — Seven gang units cut 7.9 acres per hour. Five gang units cut 6.2 acres per hour. Three gang units cut 2.5 acres per hour. (Allowance is made for transport.) (Clipping disposal cuts 1.2 acres from three gang units.)

Cost of operating machinery may be broken down to four factors:

1. COST OF UNIT

Although the list price of the unit will be readily available, the cost per year is not. Maintenance, climate and terrain all affect the eventual life of the machine. Assuming a seven year life for the independent tractor unit and the five gang unit while assuming a four year life for the three gang triplex, the cost per year of each unit would be:

7 Gang Heavy —	\$4550
5 Gang Light —	\$3550
3 Gang Triplex —	\$1900

Where clippings are collected, it is possible that two three gang units are required to serve the golf course fairways. (Note, that in practice many golf courses have purchased three or four triplexes for their course. They are utilized for multiple cutting applications. The use of one type of machine on the course allows flexible scheduling and back-up.)

2. MAINTENANCE COSTS

Estimated maintenance costs of the units are:

7 Gang Heavy —	\$1600
5 Gang Light —	\$1200
3 Gang Triplex —	\$ 250

3. LABOR COSTS

This is the most difficult item to generalize since each golf course is unique. Let us assume the worst case for lightweight mowing, i.e., very little time is saved in transport or multiple usages of the lightweight units. In such a case, the productivity of each unit is estimated as:

7 Gang Heavy —	7.9 acres per hour
5 Gang Light —	6.2 acres per hour
3 Gang Triplex —	2.5 acres per hour

Therefore, a course with 30 acres of fairways cut 75 times a year by an operator paid \$5.00/hour would cost:

7 Gang Heavy —	\$1425
5 Gang Light —	\$1815
3 Gang Triplex —	\$4500

(NOTE: Removal of clippings could reduce the lightweight productivity by 50% thereby doubling the yearly labor cost.)

4. FUEL COSTS

Assuming a fuel cost of \$1.20 per gallon, the yearly cost for the 30 acres of fairways would be:

7 Gang Heavy —	\$410
5 Gang Light —	\$400
3 Gang Triplex —	\$780

(NOTE: Removal of clippings will increase fuel expense. Assuming unit is left running, at worst it could double the cost.)

Our worst case assumptions would lead to the following total yearly cost:

7 Gang Heavy —	\$ 7,985
5 Gang Light —	\$ 6,965
3 Gang Triplex —	\$ 7,430
3 Gang Triplex with catchers —	\$12,650
(one unit) to	\$14,800
(two units)	

CONCLUSION

There is no doubt there are differences in cost between the different methods. However, the total difference is dependent on each individual course. It certainly takes more hours to mow the fairways with a smaller unit. Depreciation, maintenance and the cost per operator are factors that vary enough that each superintendent must evaluate his operation. The benefits of lightweight mowing are evident, however, the cost is not obvious.

