

And, even though this example has been accepted as the "Rub of the Green" of today, the Golf Course Superintendent will still suffer the blame, because the golf course was too dry!

Let's suppose that we did employ "survival of the fittest" management on our golf courses. Obviously, there would be a good amount of "browned out" areas as well as areas of vigorous, healthy green turf. Proficient golfers, eventually landing in areas of "green growth" would complain about the unfairness of the situation ... less than three feet away would have been a perfect lie on dormant grass, and here he is, on green grass. Conversely, the poor golfer would eventually find himself on the "browned out" area, neighboring the green turf he desires. How many times have you, myself, and all associated with golf course maintenance been subjected to this statement by the golfer, "I only ask one thing from a golf course ... consistency!"

The United States Golf Association has also encouraged this attitude by the numerous rulings in the "Decisions on the Rules of Golf by the U.S.G.A." so that the game will be as "fair" for one player as it is for another. Because of this, golf has committed itself. Unless the rules of golf change drastically, then, as Golf Course Superintendents, we too, are committed to provide consistency throughout the golf course. To provide this dictated consistency, the Golf Course Superintendent has two alternatives. Either we kill all turf equally or we must make all turf similar in texture, color, and playability. Obviously, a golf operation with no turf has no chance for success, therefore, the Golf Course Superintendent strives for evenly textured turfgrass. The "by-product" of this "forced management" program is green, lush, vigorous turf, clipped daily to give it the consistency dictated by our membership and supported the United States Golf Association's Rules of Golf and subsequent decisions.

Al, there is an axiom in our profession that you are surely aware of: "Dead turf is not the problem, it is merely the result of another problem". This means that although we see the dead turf, we must realize that it died from some other reason ... the true problem. It could have died from compaction, poor drainage, equipment damage, disease, overwatering, underwatering, and on and on through the innumerable other causes. From our training, we know that we will never have healthy turf, unless the true problem is corrected, otherwise the turf will never have a chance for survival.

Following this line of thinking, I contend that the extensive management programs employed in golf course maintenance are not the problem. From my side of the fence I see today's management programs as the result of the dictates of the United States Golf Association itself, through it's rules and "decisions" ... the striving for equitable playing conditions. This quest for consistency has caused golf course management to strive for today's ultimate manicuring of the golf course. Very honestly, Al, can we truly be expected to follow any other path? Why has the burden of "purist" been placed solely upon the Golf Course Superintendents' shoulder? Extensive maintenance is not the problem, it is merely the result of "Decisions on the Rules of Golf by the U.S.G.A.", the actual rules themselves, and the demand for equitable consistency. As we cannot expect the "dead turf" to survive under the same conditions, we cannot expect maintenance of golf courses to change unless the rules themselves change drastically. As long as the United

States Golf Association is committed to the equitable, consistent playing surfaces over 100% of the golf course, then I, as a Professional Golf Course Superintendent, will devote all my efforts to conform to this United States Golf Association policy. You cannot have survival of the fittest, resulting in uneven growth and patches of live and dead turf as well as consistency at the same time.

What, then, is the alternative? I believe the challenge is now before us. We must breed, and support the breeding of finer textured drought resistant, and above all, consistent turfgrass varieties that can survive under all soil conditions and differences in nature. The U.S.G.A. Green Section and every Golf Course Superintendent across the United States must find a way to please all. Until this has been realized, there is truly no hope of "returning to the good old days".

Al, I don't mean to come across as criticizing the United States Golf Association. Golf has made many changes in all aspects of the game. Equipment has become much more sophisticated, to the extent of now being designed by a computer! Golf course architecture has also made numerous changes from the early "penal" design concept to the "strategic" concept with "heroic" and "redan" principals employed. The result of these changes has been to tilt the balance between strategy, psychology, skill and luck. Within the structure of these changes has also seen golf course maintenance progress towards the consistency dictated by the alternations in equipment, architecture, and the interpretations of the rules by the United States Golf Association.

So please, when this discussion arises again, don't allow the finger to be immediately pointed at my profession of Golf Course Superintendent. Ultimately, the finger must be directed towards those truly responsible for creating this "monster" ... The United States Golf Association itself. Actually, the issue should have died immediately, when the very first ruling was made contrary to: "Play the course as you find it, and play the ball as it lies". That first lenient decision dictated the policy of the future of golf course maintenance and any other conclusion is unfair to the most devoted individual in golf ... THE GOLF COURSE SUPERINTENDENT.

Sincerely,
James A. Bertoni
La Jolla Country Club
La Jolla, CA

Editor's note - "Play the ball as it lies" and the scores will change?

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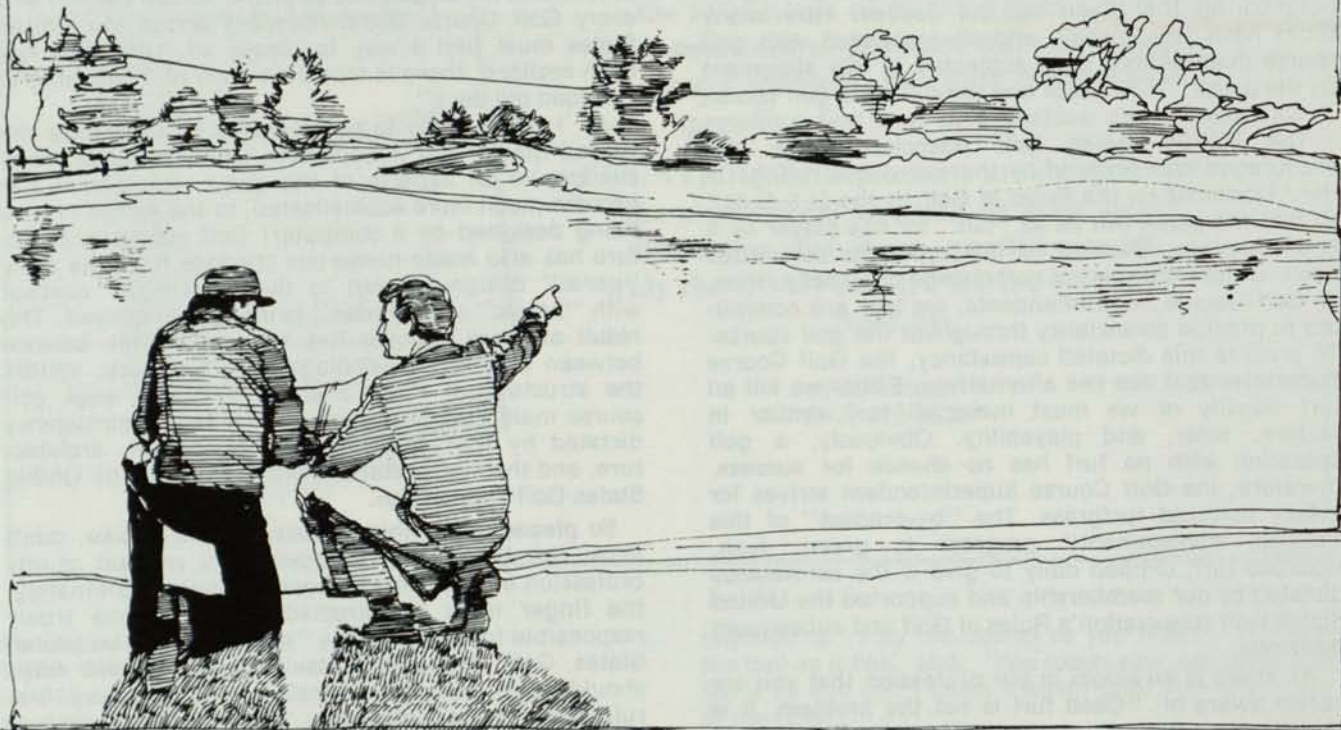
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CHEMICAL RENOVATION OF COOL-SEASON TURFGRASS SPECIES WITH GLYPHOSATE

W. M. Riden and J. M. Duich
The Pennsylvania State University

Mature stands of colonial bentgrass, creeping bentgrass, tall fescue, and creeping bent infested Kentucky bluegrass were chemically renovated with glyphosate at 4 rates on 5 dates of treatment application. Fall 1975 treatments were followed by groove seeding of Pennfine perennial ryegrass. No significant difference on ryegrass seedling stand among treatments was found. Survivors of creeping bentgrass and Kentucky bluegrass were found in the bluegrass plot, but the low numbers were non-significant among treatments. No survival was found in the bentgrass plot. Tall fescue survival was significantly greater on treatments applied just before a drizzle. The other dates and rates were not significantly different. In other experiments, the effect of glyphosate rate and surfactant were evaluated on tall fescue and red fescue. Significant differences were found between rates but not surfactant levels.

Time of grooving was also evaluated for effect on glyphosate activity using groove treatments before and after chemical application at several intervals. Significantly greater survival of creeping bentgrass occurred when the area was grooved within 4 hours after application. Treatments grooved more than 4 hours after application were not significantly different.

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WE HAVE A GOLF CART PROBLEM!

Simply, some of our members and guests refuse to cooperate when "ROUGH ONLY - NO CROSS-OVERS" is posted for cart use.

In the recent 10 day rainy period, some 3 inches of rain fell and left our fairways in an extremely soggy conditions. With the Member-Guest day and other events scheduled, the Green Committee tried to be generous and asked that golf cart operators stay off the fairways entirely. Signs were posted in the clubhouse, on the 1st and 10th tees, at the beginning of all 18 fairways and on every golf cart. Still, we experienced considerable damage from the carts on the fairways. In fact, some carts actually got stuck in the center of the 10th fairway.

In our judgment, about 80% of the members complied with our request and the other 20% did not seem to care. If this is the sort of response we see in the future, you can expect to see more of "NO CARTS TODAY".

The Committee feels the income from the use of carts on wet days is far overshadowed by the cost and time involved in the re-seeding and repair to turfgrass damage. Our answer is that if the membership cannot exhibit better self discipline in this matter, the Committee will have to be a great deal more restrictive when course conditions are borderline.

We see only one other possible solution. The outlay of perhaps a quarter million dollars to pave an asphalt path around the entire 18 holes and we are not sure the membership would agree to that.

Everyone can help by passing the word along to the 20% who are the crux of the problem. Let us take pride in our golf course, we have one of the finest in the country. Let us treat our course the same way it has treated us for many years, "First-Class".

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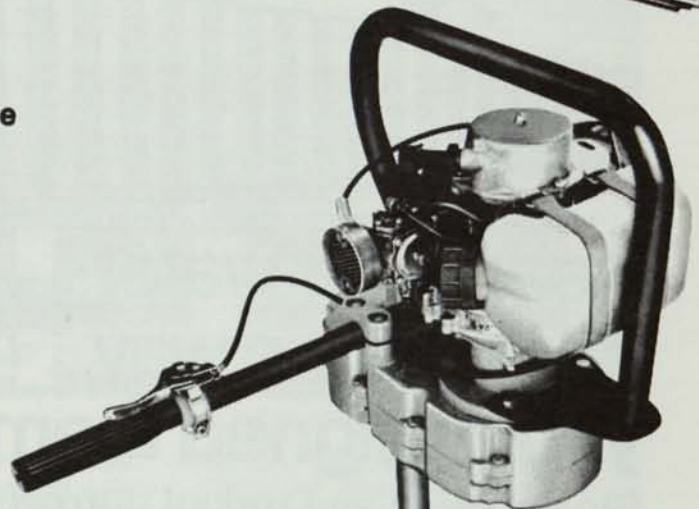
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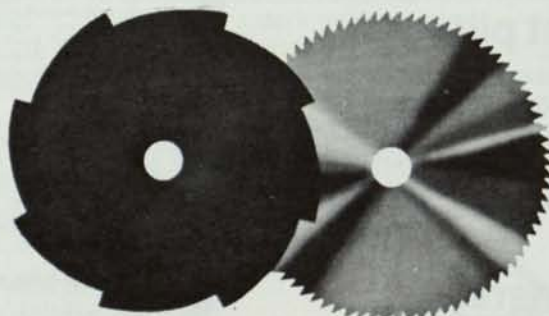
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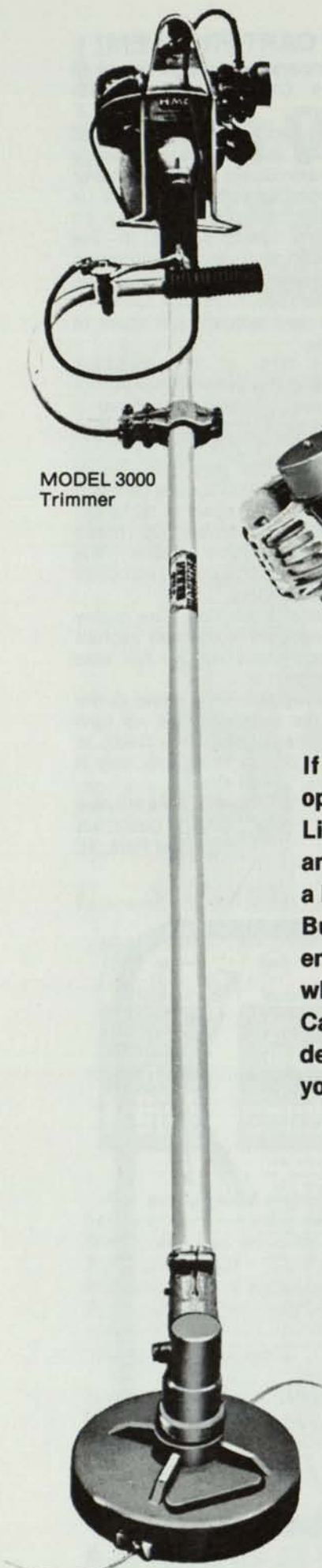


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To: Sugar Creek Golf Course Administrative Board
From: Tim Miles, Golf Course Manager
Date: January 7, 1977
Re: Golf Course Equipment - Power Trap King

At the December 14, 1976, meeting of the Sugar Creek Golf Course Administrative Board I recommended the purchase of a motorized sand trap rake. The Administrative Board requested a report concerning the economic justification for the purchase of the trap rake. This report will focus on the procedures required for good sand trap maintenance, plus the costs and benefits derived.

1. What is necessary to have well-maintained sand traps?
 - a. Replenish sand as required on a yearly basis to have 5 to 7 inches uniformly distributed in each bunker.
 - b. Edging 3 to 5 times per year to maintain the original size of the bunker and to provide a neat, well-trimmed appearance.
 - c. Placement of sand on slopes after rain washouts.
 - d. Deseeding bunkers as required or the application of pre-emergent herbicides to eliminate weed growth. Frequent raking of the bunker dramatically decreases weed growth.
 - e. Frequent raking to remove footprints, loosen sand structure, decrease weed growth, and ultimately provide a surface which is not only attractive, but allows for the proper playing of the game.
2. What are the costs of maintaining sand traps by hand raking versus mechanical raking?

Cost for replacement of lost sand, edging, and correcting sand washouts after rains are the same using either hand raking or mechanical raking. Assuming that sand traps are raked thoroughly on the average of once every two days from April 1st through October 31st, means traps would be raked approximately 107 times per season.

To do a thorough job raking the twelve large bunkers at Sugar Creek Golf Course requires the following manhours:

Hand raking - 2 to 3 hours, which equals 6 manhours/raking or 642 manhours per year.

Trap King - 1 man for 1½ hours, which equals 1½ manhours/raking or 161 manhours/year.

- a. To calculate cost of hand raking:
 1. 642 hours to rake traps
 2. $642 \times \$3.00/\text{hr} = \$1,926/\text{yr}$
- b. To calculate cost of Trap King raking:
 1. Initial cost of machine = \$1,764, with a life of 3 years = $\$588.00/\text{yr}$

2. $161 \text{ manhours to rake traps} \times \$3.00/\text{hr} = 483.00$
 3. Gasoline to operate (2 gals/raking) = 170.00
 4. Repairs & servicing = 180.00
- \$1,421.00

- c. To calculate the difference in costs of raking by hand versus using a Trap King mechanical rake:
 1. Item a (\$1,926) less Item b (\$1,421) = \$505.00
 2. This figure (\$505) reflects the difference in cost of raking sand traps by hand versus mechanical methods with the number of rakings constant and the quality of finished product constant. It does not include the savings which would be accrued by the amount of deseeding which would be decreased using a mechanical rake.

Observations:

1. Frequency of sand trap raking, using the mechanical method could be increased by 1/3rd without exceeding hand raking costs.
2. The mechanical method on a day-to-day basis will provide more deeply-cultivated and smoother sand traps.
3. The mechanical rake can be used for transport, if necessary, to change cups and police debris.



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ESCALATING PROBLEMS OF THE GOLF COURSE TURF: THE DISEASE DISASTER OF 1977

The growing complexities of our daily lives in the atomic age are spilling over to turf management. The problems of maintaining a healthy turf are becoming more complex and demanding. A little more than a decade ago, many superintendents encountered problems that bordered on disaster:

"... USGA Midwestern Section Agronomist James Holmes says that Pythium blight and other fungi killed up to 75 percent of the fairways". Hardest hit courses were in the Chicago and Minneapolis-St. Paul areas..." Curiously it was the better courses with the big maintenance budgets that suffered the most!!!"

Golf Course Operations, November, 1964

"... Never has the Chicago area experienced such generalized golf course troubles in turf maintenance. Fairways were hardest hit, but many courses had problems on greens and tees as well..."

"... Turf-grasses lose vigor, are severely weakened and fail to respond to even maximum maintenance. Consequently, a myriad of pathogens such as diseases causing fungi become damaging".

The Golf Course Reporter, September-October 1964

In 1977, the problems appear to have deepened. Adverse weather conditions brought up to the surface problems that many superintendents feel are worse than those encountered in the past. Under these conditions it is essential that we focus on some fundamentals of the turf management.

Combating the Turf Disease Through Balance Nutrition

Over time, virtually every industry moves from pioneering experiences to the adoption of modern, scientific production methods. This same development occurred in the Golf Course Maintenance industry. In the past, dark green and beautiful turf was based on empirical experience. Now, it requires engineering, scientific knowledge and artistic ability on the part of the Superintendent. Nutrition of grasses and the battle against so-called "diseases" is based today on scientific principles. These are, invariably, derived from a detailed, extensive knowledge about the condition of the soil. Thus, soil testing is an essential part of a systematic approach to dealing with turf diseases. However, most soil testing today is based on primitive knowledge of the soil. Many of these tests are incomplete both in scope and depth. They fail to take into consideration scientific advances in the chemistry of the soil and irrigation water. Only a complete quantitative analysis can provide a basis necessary for the maintenance of vigorous and healthy turf.

Main Advantages Resulting from Quantitative Soil and Irrigation Water Analysis

- 1) Elimination of "diseases from deficiencies and harmful excesses of essential macronutrients and either high or low pH.
- 2) Elimination of "diseases from deficiencies and toxicities of essential minor elements.
- 3) Elimination of "diseases which have origin in backward effects of sprays and other chemicals.
- 4) Elimination or limitation of "diseases" from polluted irrigation water.
- 5) Recovery of vigorous growth of grasses of balanced nutrition and rebuilding of the physiological defense of grasses against infectious diseases and fungi.

6) New strains of diseases and varieties of fungi such as the new variety of Pythium sp. would find it more difficult to survive if proper nutrition was practiced resulting in healthier plants which would be more resistant.

7) Agronomist operation for the balance soil environment for turf grasses.

Efficient Testing Program for Golf Courses Consist of:

1) Samples of soil from each tee, fairway and green separately are taken scientifically by specially trained personnel.

2) Sample of irrigation water for analyses.

3) The soil analysis performed in modern laboratories, for major and minor elements and other important factors for the growing plants (grasses).

4) The best soil testing concept, scientifically up to date is inevitable.

5) Scientific report based on the results of analysis includes interpretation of analytical figures and recommendations nutrients (elements) for the balance of soils on each green, fairway and tee by fertilizing program for 3 years.

Based on the Report of the Analysis and the Resulting Recommendations a Practical Program Should be Made for the Golf Course Including:

1) Fertilizing plan for the golf course with time-tables for soil, grass requirements and seasonal variations:

2) Purchasing plan for fertilizers per year (kind, amount, price per unit, etc.)

3) Top-dressing plan for greens, tees, lime-material must be analyzed and fit for the balance of soil environment.

Direct Financial Advantages Resulting from Practical Program

1) Expenses for sprays (chemicals) and labor are actually decreased because diseases are eliminated or limited.

2) Considerable savings are realized because rebuilding of greens and tees are not necessary, with the exception of greens that are poorly located, poorly constructed or absolutely ruined.

3) Eliminating expenses for labor and fertilizers which increase deficiency and toxicity of certain elements in the soil or influence unfavorable pH, as well as nutrients which are in excess in soil and do not contribute to a vigorous growth of grasses.

4) The most economical investment is realized for labor and acquisition of fertilizers for elimination of deficiencies or toxicities and balance of pH through proper nutrition of the grasses on certain tees, greens, and fairways.

5) The highest financial profit results from a better turf which attracts more golfers on the course.

Quantitative Soil Analysis or Rebuilding of Course

Expensive, new, rebuilt, or renewed golf courses are worthwhile to take under control because the danger of diseases, fungi, winter injuries, etc., exists in unbalanced soil environment. Law of the minimum and harmful maximum remains the same for new or old golf courses.

Maintaining a beautiful golf course is possible either by complete soil analysis with proper treatment, or, by rebuilding to change the basic soil environment. However, the cost of performing a complete soil analysis is only a fraction of the cost of rebuilding a green. Therefore, the expense for soil analysis is the best and most profitable investment in golf course business.

There are many things which add to the attractiveness and beauty of golf courses, as an example, the irrigation system, decorative trees and flowers, to name a few. However, the control of soil environment (by means of quantitative soil analysis) is basically essential for a green, healthy and vigorous turf which attracts golfers. Maintenance of a golf course at the top level of attractiveness is quite difficult and requires engineering skill and artistic ability based on scientific principles and natural laws - an immense responsibility for golf course Superintendents in the atomic age.

Vaclav Zolman

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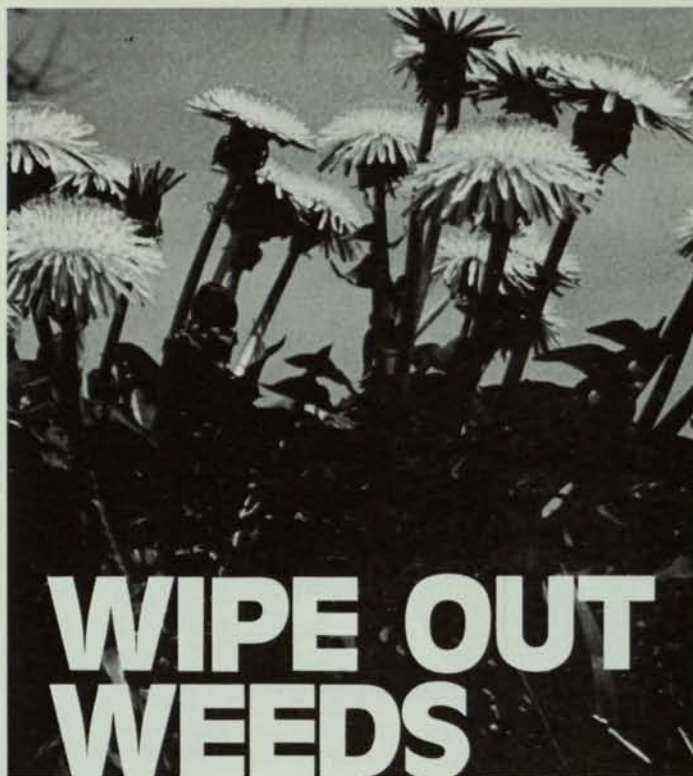
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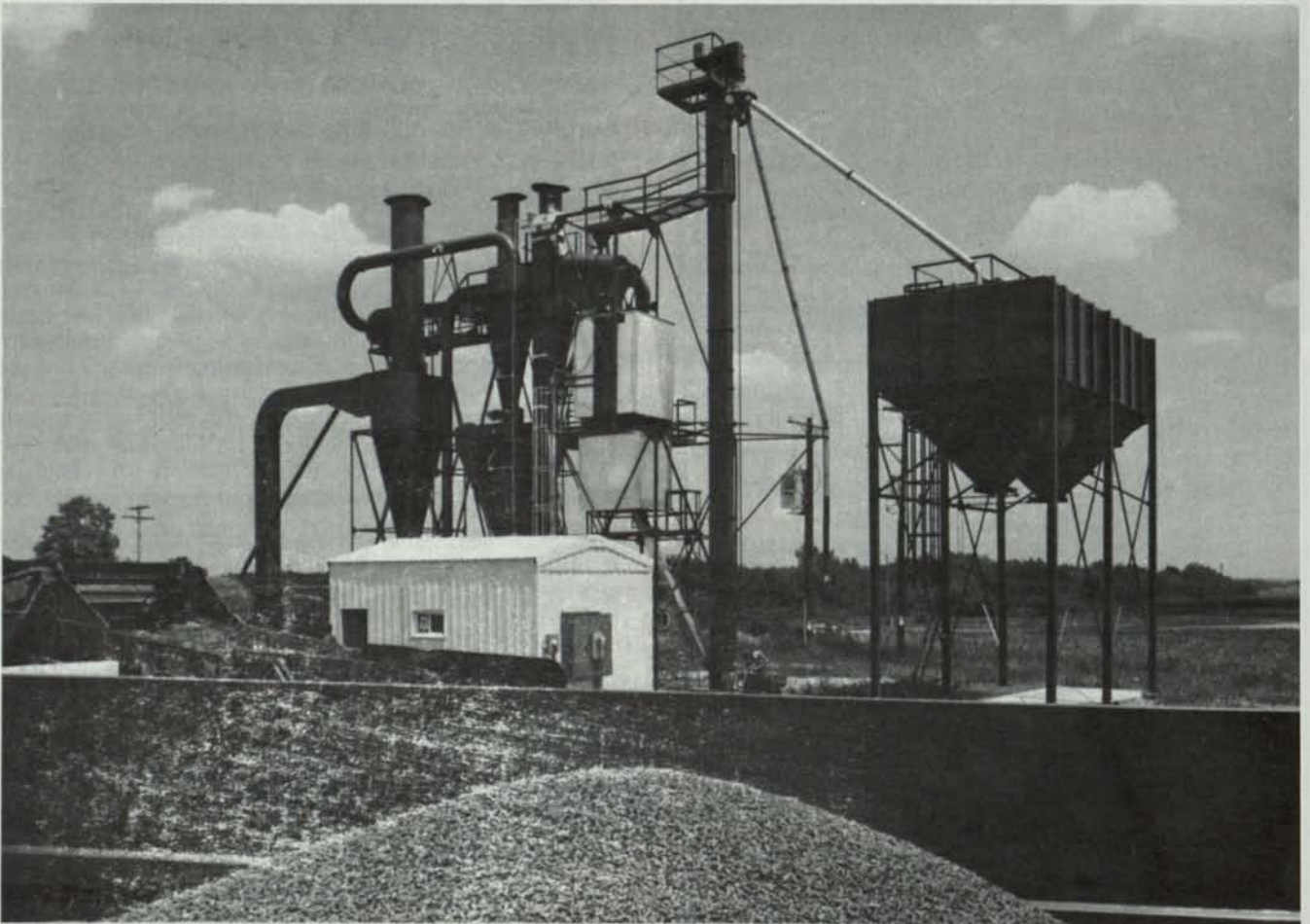
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**PERTAINING TO THE TWO LARGE PICTURES
ACROSS THE PAGE:**

Below is a letter from Ben Warren who sent the pictures to THE BULL SHEET.

I am sending you pictures of our bluegrass clipping dehydration operation.

Two pictures are enclosed. One showing a mower we have developed for catching clippings and the second an overall view of the dehydrating plant with the final product in the foreground.

The reasons for this installation are improvement of our sod product by removing clippings and the pellets have a significant value as stock feed. They analyze about 25% protein and have substantial amounts of vitamin A and xanthophyl (a pigmenting chemical used in poultry culture).

The mower consists of two lines of units having hydraulically driven reels. The front throws to the rear and the rear throws forward to a transverse conveyor which moves the clippings to a center conveyor which conveys them to the rear mounted dump unit.

The dehydrating plant consists of a feeding table, rotating drying drum, hammer mill, pelletizing mill, associated cyclones for separating solids from air stream, automatic scale, and storage bins.

P.S. The two men in the mower picture on left side, are Bob Warren on the right and James Wallace from England on the left. He is the Chief Groundsman for the London Parks.

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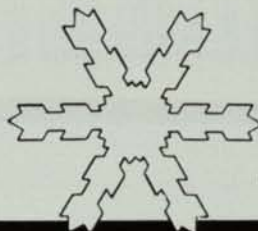
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