"Green is Beautiful"

Ontario Golf Superintendents Association

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PRESIDENT'S MESSAGE

The Board of Directors have already had two productive meetings with great input from the attending Board members. One of the prime objectives is to introduce regionalization to the O.G.S.A. Full representation by the membership and Board of Directors from all parts of the Province will do a great deal to advance the Turf Industry and the Course Superintendent as a Professional. It must be done very carefully so that the identity and active interest of each Region will not be lost in the unification program.

There are other projects which are in the works but not formalized yet. I would direct your attention to the Ontario Turfgrass Research Foundation release in this magazine. As all of you know, each member of the O.G.S.A. is a member of the Research Foundation. Your support is paramount.

PAUL WHITE,
O.G.S.A. President.

BOARD OF DIRECTORS - 1980

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MEETINGS & SPEAKERS . . . . . DAVID MOOTE - Scarborough

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MEETINGS 1980

Date	Course	Host
Friday, March 28	Scarborough Golf Club - Curling Meeting	David Moote
Monday, May 5	Roseland Golf Club	Bud Hooper
Thursday, June 12	Galt Country Club - Turf Plots	Paul Scenna
Friday, July 25	Summit Golf & Country Club - President, Greenschairman, Supt. Day	Doug Hoskins
September	Pro Superintendent	
Monday, September 29	Dalewood Golf & Country Club - McClumpha Tournament	Dan Ardley
Tuesday, October 14	Bayview Golf & Country Club	Jim Wyllie
December	Annual Meeting	
January, 1981	University of Guelph - Annual Symposium	

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ANNUAL MEETING

On December 3, 1979 our Annual Meeting was held at Aurora Highlands Golf Club. Paul White of Lambton Golf and Country Club was elected our new President. Dan Ardley and David Moote are the newest Directors elected to the Board.

Golf winners for 1979 were:

Low Gross – Bill Bowen, Peterborough Golf Club
2nd Low Gross – Hugh Kirkpatrick, Westmount Golf Club
Low Net – Bob Heron, Markland Wood Golf Club
2nd Low Net – Ken Wright, National Golf Club

The Ontario Turfgrass Research Foundation conducted their first meeting and the Board members of the Foundation were increased from three to seven.

Elected to the Board for a 1 year term:

Keith Nesbit – Westview Golf Club
Alan Beeney – North Halton Golf Club
Paul White – Lambton Golf Club
Paul Dermott – Oakdale Golf Club

Elected for a 2 year term:

Richard Duke – Duke Lawn Equipment
Dr. Clayton Switzer – University of Guelph
Gord Witteuken – Board of Trade Golf Club

Following the Meeting we sat down to a delicious buffet dinner. Special thanks to Whitey Jones and Aurora Golf Club for another fine day.

CHRISTMAS DANCE

Our Annual Christmas Dance was held at Oakdale Golf Club, hosted by Jackie and Paul Dermott. Thirty-five couples sat down to a fine buffet dinner. Special thanks to Rae Murray and C-I-L for the donation of corsages for the ladies and the Oakdale Golf Club for another fine evening.

UNIVERSITY OF GUELPH HOSTS JANUARY SYMPOSIUM

Over 110 Superintendents, Assistants, Suppliers and Guests attended a fine program of speakers at our Annual Symposium. The facilities and food at the University was excellent. Several talks will be presented in our Newsletter throughout the year. The Association has already booked the University for next years' Symposium.

BURFORD FERTILIZERS LIMITED

Burford Fertilizers Limited is pleased to announce Allan McCombs, N.P.D. to represent their full line of Turf Fertilizers in the Toronto Area. Allan brings a broad experience to the Golf Turf Field, being a graduate of the Niagara Parks School, attending courses at Univerity of Illinois and was Assistant Superintendent of 36 hole Medinah, Illinois, U.S. Open Course before returning to Canada. Burford Fertilizers has four plants to assure a supply of a complete line of Turf Improvement Programs.

SOD GROWER MAKES FEED OF DEHYDRATED CLIPPINGS

Warren's Turf Nursery, Inc. has discovered dehydrated grass clippings to be a valuable agricultural product used for poultry, cattle, and horse feed and plans to expand production.

After experiments with the USDA and the University of California a few years ago, Warren constructed a pilot plant for dehydrating grass clippings. The clippings are converted into dehydrated pellets which sell for $150 to $200 a ton. One acre of grass yields four to six tons of dried pelletized clippings a year.

Warren enlarged the pilot plant in California and built a second plant at its Wisconsin nursery. It now has plans to construct dehydration plants at Plymouth, OH; Anderson, IN; Middletown, NJ; and near Chicago, IL.

The actual value of dehydrated clippings is about twice the value of dehydrated alfalfa because of the higher content of protein, caratene, and xanthophil. Xanthophil is of special value to the poultry industry because it is the chemical or colouring agent that gives the skin of dressed poultry a yellowish colour rather than a whitish tinge.

Warren learned that the value of the finished product is greater when the clippings are not allowed to touch the ground and are caught in large containers as they are mowed. Its California nursery developed a mowing machine that could cut a swath of grass 21 feet wide and convey the clippings into a large hopper from which the clippings were taken every few minutes and rushed to the dehydrator. The sooner the clippings were dehydrated after mowing, the higher the protein, caratene, and xanthophil count.

From Weed, Trees & Turf - December 1979.

FROM THE EDITOR

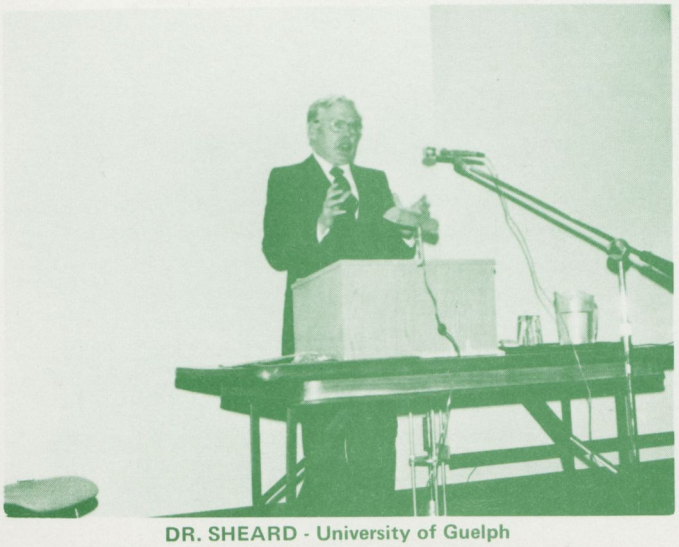
The weatherman has been co-operative with the golfer this winter. At Weston we should be charging a winter golf membership, as we have had some golfers out every week of this winter. It is Convention time again and many of our Superintendents will be heading to St. Louis and back to Toronto for the Canadian Convention. The weeks are quickly passing. Our Board has planned a fine program of events this season and we hope that you will attend our monthly functions. We are sorry to receive the resignation of Bill Bowen as Director of the O.G.S.A. We are very pleased to announounce that Al Draper from Greenhills Golf Club near London has accepted the position as a Director of the O.G.S.A.

PAUL DERMOTT - Oakdale Golf & Country Club

DR. JACK EGGENS - University of Guelph

AL DRAPER - Greenhills Golf Club - New Director 1980

DAN ARDLEY - Dalewood Golf Club - New Director 1980



DR. SHEARD - University of Guelph

BILL GLASHAN - Whirlpool Golf Club

ONTARIO TURFGRASS RESEARCH FOUNDATION

NOTICE

- PLACE: DUKE LAWN EQUIPMENT
- DATE: SATURDAY, MARCH 29th, 1980
- TIME: VIEWING - 8:00 A.M.
  AUCTION - 9:30 A.M.

Duke Lawn has agreed to accept equipment for this Auction from any golf course. All equipment must be delivered to Duke Lawn by Friday, March 21st, 1980. All equipment will be show and auctioned indoors.

TERMS OF SALE:

5% OF SALE TO AUCTIONEER
10% OF SALE UNDER $2500 TO O.T.R.F.
5% OF SALE OVER $2500 TO O.T.R.F.

There is no charge if your equipment does not sell if you have a reserve bid.

THE FUTURE OF GOLF COURSES IN ONTARIO*

C. M. Switzer, Ontario Agricultural College, University of Guelph

*Presented to the January Seminar of the Ontario Golf Course Superintendents, Guelph, Ontario, January 11, 1980.

As we enter a new decade it is appropriate that we look to the future to consider what effects various changes are likely to have on the operation of golf courses in Ontario. Although it is impossible for anyone to predict for certain what will happen, we can consider some of the factors that we know exist and that are likely to exist in the near future and then reflect on how these factors might bring about changes.

Energy:

1. The probable shortage and the definite increase in cost of energy will result in less travel for pleasure. This should have the effect of increasing the play on golf courses, particularly those that are accessible to public transportation and close to areas to high population density.
2. What priorities will golf courses receive for limited fossil fuel energy? My guess is that they will not be rated too highly by the decision makers and therefore it is important that golf course superintendents consider every way possible to reduce the inputs of energy into their operations.
3. Fertilizer will be one of the first commodities to be affected by increasing cost of energy as, of course, nitrogen fertilizer comes from natural gas. Also, phosphate fertilizer has to be imported and one might question its availability in the future. Potash should not be a problem in Canada.
   Can we learn to live with grass that is lighter in colour and not growing as vigorously as we have become used to? Should we be considering more use of the English system of keeping our inputs to a minimum?
4. Irrigation - can we live with more brown areas on the course - if we can convince the golfer that this will help him (longer drives and lower scores), he should be prepared to accpet this.
5. Reduced mowing. Thirty percent of the work on parks and such areas has been estimated as being related to mowing practices. If we can slow down the growth rate of the turf we, obviously, will have to mow it less frequently. This should be the result of using less fertilizer and possibly of greater use of growth regulators. If we are prepared to live with something less than dark green turf we might be able to use some of the existing growth regulators (Embark) on fairways (not bentgrass).
6. Reduced use of fungicides and insecticides. If we have turf that is not lush and soft as it is under conditions of high water and fertilizer, we should have fewer diseases and insects. However, we may have more weeds as the turf will not be as competitive.
7. The use of good equipment, kept in top-notch condition, is another excellent way to save energy.

Education:

The interest of young people does not seem to be diminishing in the turf area. Each year we have more inquiries about our Turf Management Short Course, our Diploma Program, and our Degree and Graduate Programs. Possibly we will be able to take more students into the Diploma Program in the near future. Also, I expect that we will be developing more Independent Study courses and other types of Continuing Education to allow people to update themselves on new management techniques in their spare time at home.

Changes in Work Habits:

I expect that we will have shorter work weeks in the future and, thus, more people will have more time available for golf - thus, we can expect heavier usages of courses in the future. We can look forward to much increased costs for labour in the future. However, I believe that there is every likelihood that better trained people will be available and that there is unlikely to be a shortage of people willing to work on golf courses.

Regulations and Environmental Quality Concerns:

In the future there is no doubt that golf courses will be faced with increased regulations as to how they carry out their activities. Such regulations will deal with the use of pesticides and fertilizers, and probably we can expect to see an increase in regulations relating to noise. We need to do everything possible to ensure that those responsible for enacting such regulations are fully aware of all of the possible consequences of such regulations before they are put into law. Of course, with the general public becoming more and more concerned about the environment, we should be able to get some support if we can convince the public that it is in their benefit to have green areas such as golf courses maintained within the urban landscape.

Research:

Some of the items that require additional research that will become more and more important in the future are:

a) The breeding of grass that requires less nitrogen, less water, and that is more cold and disease resistant.
b) The development of better growth regulators - chemicals that are less phytotoxic to the turf.
c) The use of lower maintenance plantings around turf areas - in Europe, for example, the Cotoneaster is used more and more instead of annual plants.

Communication:

Interaction between golf course superintendents and researchers has been reasonably good. However, it can be improved and some of the items that come to mind that we all should consider are:

a) Attendance at meetings where superintendents and researchers can discuss problems.
b) The communicatio to the researchers of problems that need attention.
c) Better ways of getting the information from researchers to the superintendents.
d) Ways of reducing the time delay between finding new information and getting it to the users. The effectiveness of any research worker is directly related to the information that is available to him. He needs information of two kinds:

a) Information as to the major problems needing to be solved, and
b) Information on work that has already been carried out on these and related problems. Sometimes I am concerned that research workers spend too much time writing scientific papers (which, of course, they must do in order to get ahead in the system) and too little time corresponding and speaking to those for whom the research is being done..

In conclusion, I would again like to stress a point that I have made many times in the past - the importance of communicating our position to others who are not as familiar with it as we are. We should make this kind of information available to the golfers we contact and perhaps even more importantly to non-golfers. Only in this way can we insure the support that will be necessary for this industry to continue.

Thatch Development and Other Effects of Preemergence Herbicides in Kentucky Bluegrass Turf[1]

A. J. Turgeon, R. P. Freeborg, and W. N. Bruce[2]

THATCH, a tightly intermingled layer of living and dead stems, leaves, and roots of grass, develops between the green vegetation and soil surface (2). Although thatch may provide some surface resiliency and wear tolerance, it is associated with disease and insect problems, and the occurrence of localized dry spots in turf. A thatched turf is also more prone to heat, cold, and drouth injury. This is partly due to the shallow rooting associated with thatched turfs as new roots tend to develop more profusely in the thatch layer, once it is formed, rather than to penetrate into the underlying soil (4). Thatch results because of an imbalance between opposing processes of accumulation and decomposition of organic material (2). Thus, any cultural or environmental factor that stimulates excessive growth or impairs decomposition could lead to the development of thatch. Engel (3) maintained that the composition of grasses is such that their residues should decompose readily providing favorable conditions exist for decay. Ledeboer and Skogley (4) measured relatively large amounts of soluble carbohydrates in the lower sections of a thatch layer and they suggested that lignin blocks the ready entrance of microorganisms to these compounds, thus preventing their decay. Barley and Kleinig (1) reported that when earthworms (*Lumbricus terrestris* Linn.) were introduced to irrigated pastures with extensive surface mats, the thatch as a discrete layer disappeared. Raw (6) observed that leaf disappearance from the soil surface in orchards was associated with the presence of earthworms. The exact relationship between earthworms and various microorganisms in decomposing thatch and other organic debris is not entirely clear; however, it appears that the earthworms function in pulling organic material down into the soil where it is more readily decomposed. Satchell (7) reported that where earthworms flourished the amount of organic material they consumed was limited by the availability of supplies rather than their capacity to ingest it, which was estimated to be in excess of 27 mg/g worm body weight/day. Randell, Butler, and Hughes (5) applied chlorinated hydrocarbon insecticides eight times over 28 months to Kentucky bluegrass (*Poa pratensis* L.) turf and measured a substantial reduction in earthworm activity in the treated turfs along with the development of thatch. These results indicate that earthworms are highly important in preventing or regulating thatch development in turf and that careful consideration should be given to any cultural or environmental factor that might reduce their activity.

The purpose of this study was to determine the possible association of thatch development and the repeated use of several preemergence herbicides in turf, and the effects of pesticide-induced thatch on turfgrass quality through the growing season.

Table 1. Effects of four annual applications of six preemergence herbicides on the wilting tendency and other parameters in Kenblue-type Kentucky bluegrass turf on July 30, 1973; May 10, 1974; and June 28, 1974, respectively.

Treatment	Rate	Wilting tendency*	Leaf spot†	Earthworm count
	kg/ha			no./m²
Bandane	39.2	7.7	6.3	0
Benefin	2.2	1.0	3.7	64.7
Bensulide	16.8	1.0	3.7	49.2
Calcium arsenate	439.0	8.3	6.7	0
DCPA	16.8	1.0	3.7	47.2
Siduron	9.0	1.0	4.0	51.9
Untreated	---	1.0	3.7	53.6
L. S. D. 0.05		0.6	1.0	16.7
L. S. D. 0.01		0.8	1.4	23.2

* Wilting tendency ratings are based on a scale of 1 through 9, with 1 representing no wilting and 9 representing severe wilting of the turf. † Disease ratings are based on a scale of 1 through 9, with 1 representing no disease and 9 representing severe blighting of the turf.

Table 2. Effects of four annual applications of six preemergence herbicides on verdure, roots and rhizomes, and thatch development on Kenblue.

Treatment	Rate	Verdure*	Roots & rhizomes	Thatch
	kg/ha	g/10-cm plug		
Bandane	39.2	2.74	1.13	13.56
Benefin	2.2	3.34	8.03	0
Bensulide	16.8	2.85	10.43	0
Calcium arsenate	439.0	2.88	1.0	18.64
DCPA	16.8	3.03	10.22	0
Siduron	9.0	3.18	8.26	0
Untreated	---	4.48	9.28	0
L. S. D. 0.05		1.50	2.95	0.71
L. S. D. 0.01		2.03	3.97	0.95

* Above-ground shoots.

MATERIALS AND METHODS

The experimental site was an 8-year-old turf of 'Kenblue'-type Kentucky bluegrass growing in an Aquic Argiudoll (Flanagan silt loam) with a pH of 6.6. The turf was mowed twice weekly at 3.8 cm during the growing season with the clippings returned. The annual N fertility level was 2 kg/are using a 10-6-4 analysis fertilizer containing a water-soluble form of N. The turfgrass area was irrigated as needed. No cultivation or thatch removal was practiced.

The turf received applications of each of six preemergence herbicides in mid-Spring of 1970, 1971, 1972, and 1973. The plot size was 3 × 3 m arranged in a randomized complete block design of three replications. Granular formulations of bandane, benefin, bensulide, calcium arsenate, and DCPA were applied by hand inside a 6-dm high box frame while a wettable powder formulation of siduron was applied in 8 liters of water per plot.

The plots were checked regularly for turfgrass quality as affected by disease incidence, wilting tendency under high temperature stress, and other factors during the 4-year experimental period. Observations of thatch development were made in the Fall of each year by measuring the thickness of the thatch layer in 10-cm plugs cut from each plot. In May 1974, two 10-cm plugs were cut to a depth of 12.5 cm in each plot and gently washed in warm water to remove the soil. The plant material was then severed into above-ground shoots (verdure), thatch layer, and the roots and rhizomes that were previously growing in the soil. These were dried at 105 C for 24 hours and weighed. Additional plugs were cut from the plots to determine the presence of earthworms and other macrofauna in the soil. Strips of sod measuring 0.3 × 1.2 m were cut from each plot and a solution containing 25 ml of a 37% formalin in 4 liters of water was applied to the bare soil to determine the numbers of earthworms present (6).

Cores were extracted from the bandane and calcium arsenate-treated plots using a soil probe, and the thatch plus 0 to 2.5, 2.5 to 5.0, 5.0 to 10.0, and 10.0 to 15.0-cm soil depths were analyzed for residues of bandane[3] and calcium arsenate.[4]

RESULTS AND DISCUSSION

No crabgrass or other annual weeds occurred in these plots; thus, results reported herein are not related to weed development. Examination of the turf in the Fall of 1971 revealed the development of 1 to 2 cm of thatch in the bandane and calcium arsenate-treated plots, while virtually no thatch was evident in any of the other plots. Following the fourth herbicide applications, the bandane and calcium arsenate-treated plots appeared severely wilted in mid-Summer of 1973 (Table 1). In May 1974, these same plots were more seriously thinned with *Helminthosporium* leaf spot disease than the other plots. Examination of 10-cm plugs from each plot revealed substantial thatch development, less roots and rhizomes in the underlying soil, and reduced verdure in the bandane and calcium arsenate-treated plots (Table 2). The reduction in verdure was significant in the bensulide-treated plots also. Plugs were also examined for the presence of earthworms and other macrofauna. Several large, brown earthworms (*Lumbricus terrestris* Linn.) and numerous small, white worms of the class *Encytridae* were found in each plug from all plots except those treated with bandane or calcium arsenate. Utilizing a procedure developed by Raw (6), *L. terrestris* counts ranged from 0 to 64.7/m^2 with none observed in the bandane and calcium arsenate-treated plots (Table 1). A casual observation made while performing this procedure was that the infiltration rate of water applied to the soil after removing a strip of sod was substantially less in the bandane and calcium arsenate-treated plots. Presumably, this was due to the reduced rooting and absence of earthworm burrows in the soil underlying these plots. The reduced water infiltration rate observed in thatched turfs is usually attributed to the hydrophobic properties of the thatch or the existence of an interface between the thatch and the underlying soil (2). However, observations made in this study indicate that an additional factor affecting infiltration is the deteriorated physical condition of the soil underlying the thatch and that this is associated with poor rooting and the lack of earthworm activity.

The increased disease incidence, high wilting tendency, and shallow rooting observed in plots treated with bandane and calcium arsenate are probably due to thatch development (2). The thatch, in turn, was the result of an absence of earthworms and possibly other organisms essential to the breakdown of organic debris comprising thatch (1, 5, 6, 7, 8). In a similar study by Turgeon *et al* in Michigan (9), bandane-treated plots were severely diseased with stripe smut (*Ustilago striiformis* West. Niesel); however, this was not directly associated with thatch development since the pesticides untreated plots had significantly more thatch than those treated with bandane. Streu (8) proposed that the turfgrass ecosystem is highly sensitive to certain pesticides, with effects manifested as pest resurgence, reductions in decomposer organisms, and an increase in undesirable herbivores. Apparently, the factors associated with disease incidence are too complex, in some cases, to be explained simply by differential thatch development.

Table 3. Analysis of the thatch-soil profile following four annual applications of bandane at 39.2 kg/ha and calcium arsenate at 439 kg/ha to Kenblue.

Profile depth	Bandane	Calcium arsenate
cm	ppm	
Thatch layer	297.0	291.8
0.0- 2.5	24.6	183.8
2.5- 5.0	2.1	89.8
5.0-10.0	1.1	41.8
10.0-15.0	0.9	19.5

Analysis of the thatch-soil profile in plots treated with bandane or calcium arsenate revealed that over 91% of the bandane residue was in the thatch layer while less than 47% of the calcium arsenate was found in the thatch (Table 3). Thus, removal of the thatch by vertical mowing or other means should remove most of the bandane and, presumably, the principal causal factor for thatch development in the bandane-treated turf. However, even with complete removal of the thatch, a considerable amount of calcium arsenate would remain in the soil under the calcium arsenate-treated turf to inhibit earthworms and other organisms. These results suggest that, where thatch-inducing pesticides are used, the cultural program should be adjusted to compensate for the loss of earthworms and other organisms that are important in decomposing thatch and improving soil physical conditions. This may involve periodic vertical mowing to reduce the thatch accumulation or, perhaps, a regular program of core cultivation, spiking, topdressing, and other practices to overcome the adverse effects of these pesticides on the turfgrass ecosystem.

NEW MEMBERS POSTING

ALAN McCOMBS..... Burford Fertilizers Ltd.
ROBERT GOLDEN ..... Rain Bird Canada
DAVE NICHOL..... Castlemore Country Club
JOHN CUNNINGHAM ..... Meadowbrooke Golf Club

If any Member has any objection to the above persons applying for Membership in the O.G.S.A., the Secretary must be notified in writing within 30 days.

THE CANADIAN GOLF SUPERINTENDENTS ASSOCIATION

31st ANNUAL CANADIAN TURFGRASS SHOW

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