Roundup® stops tough weeds from the first tee to the clubhouse.

Tough weeds can be a problem all over your golf course. Around the greens. In fairways. In and around sandtraps. Along cart paths and driveways. Near the clubhouse. But there is one herbicide you can use in all of these weedy areas —Roundup® herbicide.

No other herbicide is more effective—and more versatile—than Roundup for control of many tough emerged weeds. Roundup is inactive in the soil. It won't wash or leach out of treated areas to injure desirable vegetation. Yet when Roundup is sprayed on the leaves of actively growing weeds, it goes right down to the roots, to control the entire plant. So treated weeds won't grow back. And don't forget Roundup can be used around your tennis courts and other recreational areas too!

See your chemical supplier soon for your supply of Roundup. It just might be the solution to your golf course weed control problems.

Monsanto

Nothing works like Roundup.

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FRONT COVER: Indentifying turfgrass disease is our theme this month, and snowmold will be one of the first to rear its ugly sclerotia (shown in insert).

The Keystone of Immaculate Turf

It still costs less to go first class.

Immaculate weed-free turf not only looks better, it also costs less.

Read how Trimec® Turf Herbicide can save you time and money, and make your work more fun.

It costs less to go first class. How many times have you heard that old truism? You know it's a fundamental fact of everything in life, but in no other phase of today's economy is it more graphically demonstrated than in the world of weed control in professional turf management.

When a turfman tries to skimp along with a narrow-spectrum herbicide on the theory that it will control the major eyesores like dandelions and chickweed, and will cost less per gallon than Trimec — he opens the door to an endless chain of problems and expenses.

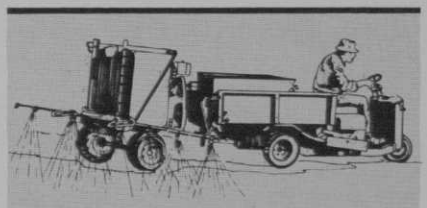
Perhaps the worst consequence is the emergence of some ugly weeds of the hard-to-kill variety that he once considered to be so rare that he didn't even think of them as a problem in his area. And, when these weeds come, they come as a crowd... out of nowhere.

Of course, you know where they came from and why they came. They're the natural consequence of using a narrow-spectrum herbicide in an area that is fertilized and watered.

The hardy weeds (which were not controlled by the narrow-spectrum herbicide) are nourished by the fertilizer and water, and fight with the grass to fill the vacancy left by the demise of the sensitive weeds. Some of them win, and weeds that were once obscure become prominent.

There's really only one efficient way to cope with the problem, and that is the Trimec way.

Trimec is the one turf herbicide with a broad enough spectrum to get those hard-to-kill weeds right along with the common, sensitive ones. How many species of broadleaf weeds will Trimec control? We are still looking for the economic broadleaf weed that Trimec will not control when applied at the right times and rate. If we ever do find such a weed, we will be very surprised. No other selective herbicide can match the broad spectrum of Trimec.



How many species of broadleaf weeds will Trimec control?

We are still looking for the economic broadleaf weed that Trimec will not control when applied at the right times and rate. If we ever do find such a weed, we will be very surprised. ***No other selective herbicide can match the broad spectrum of Trimec.***

Yet, with all this power, Trimec is friendly to the environment in terms of safety to grasses, because no ingredient in Trimec is at a phytotoxic level.

And when you get to the bottom line, Trimec is less expensive than its less-effective contemporaries because it requires less chemical per acre for maximum weed control, and it saves labor costs because it does it right the first time so you don't have to do it over. Thus, when you use Trimec, you not only look good to the greens committee... you also look good to the finance committee.

Only Trimec gives you all of these benefits

- Controls the widest range of broadleaf weeds
- Gets hard-to-kill species with one treatment
- Wide safety margin for lawn grasses
- Minimum hazard from root absorption
- No vapor action after application
- Effective weed control in wide temperature range
- Unique formula overcomes water hardness problems
- Treated areas may be seeded within two weeks
- Non-flammable and non-corrosive in use
- Product stable several years above 32° F.
- Biodegradeable; friendly to the environment
- Bentgrass formula also is available.

In summary

The Trimec record speaks for itself. No other turf herbicide available today is the equal of Trimec, not only in providing superior broadleaf weed control, but also in terms of safety to grasses — and in total cost. No wonder an overwhelming majority of golf course superintendents agree: *Dollar for dollar and acre for acre of immaculate, weed-free turf, Trimec is the most efficient broadleaf herbicide on the market ... period.*

See your authorized Gordon distributor, today.

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Clippings

Brief bits of news from in and around the golf business. . .

Overall fertilizer consumption is predicted to exceed 55 million tons this year, according to **Edwin Wheeler,** President of The Fertilizer Institute. Wheeler cautioned that low water levels in the nation's major river systems signal the "greatest single concern we all ought to have" in 1981.

Play on **Michigan golf courses** should get a boost from the **1981 Michigan Golfers Map & Guide,** prepared by **Roy and Betty Rasmussen.** The guide lists the location and features of over 640 courses and includes 250 "two play for one" coupons, making the book worth over $1500. Copies are available for $5.95 from RSG Publishing Inc., P.O. Box 28038, Detroit, MI 48228.

Andy Bean has collaborated with golf architect **Ron Garl** in the planning and construction of a third course for **Grenelefe Golf And Tennis Resort** in Haines City, Florida. The course will carry Bean's name.

Sixty-five superintendents met at Indian Springs Golf Club for the annual **Central Penn GCSA** educational exchange of techniques. New officers elected include: President **David Portz,** Brookside CC, Vice president **John McCormick,** Berleigh CC, and Secretary-Treasurer **Terry L. Wueschinski, CGCS.**

Dr. J.M. Vargas (right), Associate Professor at Michigan State University, accepts a turfgrass research grant from the **O.J. Noer Foundation** from **Frank Forier,** Member of the Board of Directors of the Foundation. The presentation was made at the 51st Annual Michigan Turfgrass Conference.

Gary T. Grigg, CGCS, Albuquerque, New Mexico, has been promoted by Kindred, Watts and associates to Agronomist and Director of Golf Maintenance. Gary received his undergraduate degree in Agriculture Entomology from Utah State University and holds a Masters Degree in Agronomy from Michigan State University. He will be responsible for the maintenance programs of all golf courses in the Kindred, Watts and associates organization. He will be responsible for consulting services, new construction, redesign construction, irrigation system design and installation as well as on-going turf management. Gary will be moving his family to Houston, Texas where the company office is located.

Maria Cinque has been named Turfgrass Agent for Long Island. Ms. Cinque had worked with Bob O'Knefski, who recently retired from the position, since 1974. As Turfgrass Agent, she will be responsible for coordinating turfgrass programs for Long Island and participate as a liason with the Cornell Turfgrass Team along with Drs. Smiley, Petrovic, Tashiro, Bing and Harrison.

Century Rain-Aid has purchased the Addison, Illinois sprinkler irrigation distribution facility only of the Sisco Division, A.J. Miller, Inc. Most of the former Sisco personnel, including **Jim Flannigan** and **Mark Curtis,** have joined Century Rain-Aid's Elk Grove branch near Chicago's Ohare International Airport.

Diamond Shamrock Corporation, The Agricultural Chemicals Division, has acquired the total assets of Fallek-Lankro Corporation. Part of the acquisition included the phenoxy herbicide plant, located in Tuscaloosa, Alabama. The plant makes Diamond Shamrock the only North American producer of a full range of phenoxies, including MCPA, MCPP, 2,4-DP, and 2,4-D.

R.M. (Dick) Grandy has been named Marketing Director of **International Spike, Inc.,** manufacturers of Jobe's® spikes for plants and trees. Grandy was formerly National Sales Manager. **Harlan Moreland** is now National Sales Manager.

The USGA still has copies of a jointly sponsored conference on **Wastewater Irrigation of Recreational Turfgrass,** that was held in mid-November of 1978. Write USGA, Golf House, Liberty Corner Road, Far Hills, NJ 07931, or call: 201/234-2300.

The National Club Association will hold its **Legislative Conference and Annual Meeting** on Tuesday, May 19, in Washington, D.C. at the Capitol Hill Club, from 8 a.m. until 4:30 p.m. The NCA address is Suite 609, 1625 Eye Street, N.W., Washington, D.C. 20006.

The Idea File

Steve Hagan, Superintendent
Clear Lake Golf Club
Amery, WI

Fertilizing greens

At our course, we use a granular fertilizer on greens. To maintain a schedule of daily greens mowing, after fertilizing we mow once **without** the buckets on our greens mower. This method of mowing has greatly reduced the amount of fertilizer that is picked up in subsequent mowings and it also increases the benefit our greens receive from the fertilizing.

WHEN OUR GAS GOLF CARS TAKE THE COURSE, THEY COME UP WITH THE RIGHT NUMBERS.

AMF Harley-Davidson® Gas Golf Cars produce the right numbers on the bottom line–to generate more profit and a better return on investment for your golf course.

That's why we've been a leader for 17 years. But you can't stay ahead by standing still. So we work overtime to improve our fine quality cars.

Take our 250 cc air-cooled engine. One of its major advantages is the simplicity of its design.

We do things like redesign the crankshaft to increase dependability.

Or we redesign the governor control for consistent vehicle performance.

Fact is, we're so confident of this engine, it comes with a 2 year parts warranty on key engine components and the primary transmission. No one has anything like it.

No one has anything like our styling, either. AMF Harley-Davidson golf cars look more prestigious. Their classic look enhances the image of your course with your players.

But there's more that makes our golf cars exceptional values.

Our hinged fiberglass body makes servicing fast and easy.

Our 3-wheel cars have a wraparound front bumper with 2 touch points for added stability. It's exclusive with us.

But then, the dependable quality of these golf cars is a proven fact. They have the industry's highest trade-in value.

And most important of all, our cars are sold, leased and serviced exclusively by your AMF Harley-Davidson Golf Car Dealer.

He's dedicated to improving your return on investment–better numbers, for more black ink on your bottom line. We know these new gas golf cars go a long way to proving his point.

AMF Harley-Davidson

HARLEY-DAVIDSON

WE PROVE OURSELVES ON THE BOTTOM LINE.

You'll find one on every National . . .

The little decal that means big savings!

It does more than tell you the belt sizes used on National mowers. It signifies our commitment to build a mower that can be maintained easily and inexpensively. It tells you that these are standard, off-the-shelf items available from your local supplier, not a special, high-priced belt designed by a manufacturer to be available only from him. **It means less down time!**

But standard belts are only part of National's value. There's the normal maintenance factor which is reduced by National's obviously easy accessibility. Field reports tell us that **National mowers are one-third to one-half the cost** of maintaining competitive models.

Then there's greater fuel economy. National's simple, functional design means as much as 44% to 62% less fuel consumption than competitive, power-robbing, hydrostatic type rotary machines.

Best of all, **National's initial cost is less** than that of other mowers sold to do the same job.

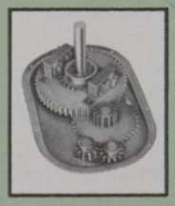
In these days when purchase price, fuel economy, continuous performance and longevity are most important, look to a National to do more work, with easier and faster maintenance, over a longer period.

Model 84" Triplex

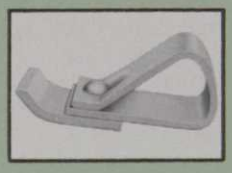
Write to us for the name of your nearest dealer. Then call for a demonstration.

Model 68" Triplex

There's more to make you forget about down time



We still cut our own gears, forward, reverse and differential, out of solid steel blanks. These durable gears, carborized, hardened and tempered, are heavier than those used in many automobiles today.



Bed knives have upturned lips for extra wear and longer service. It prevents scalping and will not allow small objects to enter and damage reels.

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News

REGULATION

Canada bans some esters of 2,4-D, wants no dioxins

Steps taken by Canada to make sure any 2,4-D sold in the country is free of TCDD, a highly poisonous dioxin, include an immediate ban on the sale of technical esters that have been shown to contain dioxins, a phase-out of all sales of the volatile butyl ester of 2,4-D, and action to ensure that all 2,4-D material is free of dioxin contamination by 1982.

In a telegram to EPA, Canada's Agriculture Minister Eugene Whelon said that studies had identified concerns about rapid evaporation and drift of butyl ester products. In response, EPA said that it feels there is no justification for action in the U.S. because products tested are either dioxin free or the concentrations do not appear to pose a health hazard. EPA will continue to assess the safety of 2,4-D, but reports that current data indicate the dioxins found in 2,4-D are significantly less toxic than TCDD found in 2,4,5-T.

DAILY FEE COURSES

Illinois public course owners/operators organize

The Illinois Association of Public Golf Courses was formally organized at a recent meeting of daily fee golf course owners and operators from throughout the state. Urban Hills CC in Richton Park was the site of the organizational meeting.

Elected to the Board of Directors for 1981 were: John W. Urban, Richton Park, President; Frank Jemsek, West Chicago, Vice president; Ben F. Brubaker, Washington, Secretary-treasurer; and Directors-at-Large Tracy Christ of Washburn and John R. Coghill, Jr. of Orland Park.

The first two programs initiated by the IAPGC were a membership drive and the publication of an association newsletter.

Among the goals and projects that the IAPGC intends to pursue are the development of an annual workshop, a tax committee, an insurance program, trade shows, idea-sharing sessions and other programs to keep members informed of trends in the industry.

OWNERSHIP CHANGES

Firestone CC is sold to Akron Management Corp.

The Firestone Tire & Rubber Company has signed an agreement to sell its 36-hole Firestone Country Club in Akron, Ohio, to Akron Management Corporation, a subsidiary of Dallas-based Club Corporation of America (CCA), a development and management company operating 95 country and city clubs in the United States. The announcement was made by Frank A. LePage, Firestone's executive vice president for corporate planning and administration, and James E. Maser, president of CCA. No purchase price is being disclosed, however, local newspapers quoted an appraised value of $5.4 million from sources familiar with the property, with the selling price as less than that.

The club will continue to be known as Firestone Country Club and the World Series of Golf, to be played August 27-30, will not be affected by the change in ownership.

REGULATION

EPA freezes Public Awareness publications

All publications, pamphlets and most press releases from the EPA's Office of Public Awareness (OPA) have been frozen by EPA acting managers. The stated reason is excessive printing and mailing costs.

EPA has been accused of "irresponsibly misrepresenting forest herbicide use to the public" according to William McCredie, Director of the Forest Environment Program of the National Forest Products Association. An OPA publication, "Consider the Connections", gave credence to a highly controversial and scientifically disputed study linking dioxin to "a heavy incidence of miscarriages, birth abnormalities and cancers among women".

OWNERSHIP CHANGES

Top management may buy Harley-Davidson from AMF

AMF has signed a letter of intent to sell the Harley-Davidson Motor Company to a group of key Harley-Davidson management personnel. This group, under the leadership of Vaughn Beals, Jr., AMF Corporate V.P. & Motorcycle Products Group Executive, includes John A. Davidson, H-D Chairman of the Board and Golf Car President.

Any such sale would be subject to further discussions and the execution of a definitive agreement which would then require approval by the Boards of Directors of both AMF and the new company being formed.

Publisher's Point

Are there too many turf conferences?

The first week of March marked the conclusion of another turf conference season; the sixth such season for me. I decided to finish the season by attending the Midwest Regional Turf Conference at Purdue though I could have gone to Iowa, Pennsylvania, Massachusetts, or Canada; each of which was holding a turf conference at the same time as the Midwest. As I have traveled the country, a question that is increasingly being asked is, "Are there too many turf conferences and trade shows?" It is an important question, whether we are a superintendent, supplier, or conference planner.

The basic educational mission of the regional turf conference is not in question. Rather, it is a question of numbers; particularly when several conferences are held in the same geographical area. One northeastern state held three separate conferences, with exhibits, during the past season. I question the practicality and need for such a concentration. I recommend combining several of the

Continues on page 36

Topdressing greens

By Ernest L. Kallander, Stony Brook Golf Course, Southboro, Mass.

Since my articles on the effect of sand and sand mixtures were published in this magazine 1979 and 1980 showing the uselessness of high quality sand to promote permeability, for the average green, I have had other misgivings when sand is the sole component.

Having refrained from the use of 100% sand after our greens were built thirteen years ago, and having many compliments on their quality, I decided to test the effect of the various other materials combined with sand. At first, we simply used the same material left over from which the green's top soil was constructed, viz: 67 percent sand, 24 percent clay loam and 9 percent peat. This was the mixture selected after tests made on our materials at Agri-Systems of Texas by Marvin H. Ferguson, employing their newly-designed percolations tests. I did not accept their recommendations completely because by actual growing tests made here (Southboro) I found that I would be watering and fertilizing much too often in order to keep the plants alive. I think we struck a fortunate balance because while the initial permeability was but 1 to 1.5 inches per hour, it has climbed to about 4 inches per hour now.

How? I think it is due to the agglomoration of the fine particles. I don't know exactly what has promoted this phenomenon but I suspect these factors: use of minimum fertilizer (last year only 3 lbs. N per 1,000 sq. ft.), practically no insecticides, sparing use of fungicides and the application of moderate amounts of gypsum ($CaSO_4$). I have appended some notes to explain the effect of gypsum. Also, we have a moderate amount of earthworms and blackbirds aplenty. Their drill holes don't bother anyone. We have never had to aerate but resort, once a year, to dethatch which I suspect is more a ritual than a necessity.

Experimental

After using up the original top soil, we tried using sand but couldn't get it to feed through our spreader without drying it up with terragreen. It took about 20 percent to make the sand flow well enough. But the mixing paid off in other ways. It permitted us to incorporate wood ashes, with their valuable potash and almost colloidal silica, etc., to correct pH with limestone, and to promote agglomeration with gypsum. You'd think that we'd ruin permeability with all this junk? Wrong. Agglomeration took care of all the fine particles. How did I know? Not only did the percolation improve but when I took samples of the soil I could easily distinguish the pellets, about the size of BB shot. When dried, though quite hard, you could crush them between your fingers into powder. Don't they get crushed by foot traffic? I find no evidence of this. Besides, they are buried by a resilient layer of turf.

What else is lacking in the use of straight sand? To anyone who has had to grow crops, the answer is obvious. You need clay or some clay-like material to supplement the humus that you are trying to dilute:

1. To firm up the turf to increase fastness of roll;
2. Promote breakdown of the dead and dying roots and stems which, in the live plant, consists of about 65 percent cellulose and 35 percent lignin. The cellulose will get chewed up by action of bacteria, etc. to promote hydrolysis into its original components, carbon dioxide and water. The lignins will be left behind— also called humus;
3. And, most importantly, maintain the ability of the built-up layer to nourish the grass without increased use of water and fertilizer; a factor that I will show is sadly lacking in a straight sand top dressing.

So, looking toward the future, with continued use of top dressing, what kind of composition will we have ten or so years from now? To answer this question, I set up some experiments to be described. They are based on the very good assumption that we will end up having a (a) large amount of top dressing with respect to humus, (3 to 1) or (b) moderate amount, or (c) a small amount, (1 to 3). This gives us a nine fold spread of one component with respect to the others. Shown on table 1.

Tests for percolation on these compositions, shown on Plate 1 and Table 3, reveal the expected result: the more the mineral (sand plus modifier, if any), the lower the percolation, but that even at 50 percent concentration, the lowest formulas (4, 5, 6) are plenty high.

As for resistance to compaction, each series is close to the others. If greater precision is required, as in the case of Vermiculite, you can use more top dressing to obtain more resistance. See Plate 2.

As for their ability to hold

Continues on page 12

TABLE 1. Compositions and C.E.C. Values (x100)

Soil no.		1	2	3	4	5	6	7	8	9	10	11	12
H.Q. Sand	Vol.	33	50	67									
	grams	195	390	585									
	CEC	0	0	0									
BM Sand	Vol.				25	38	50	25	38	50	25	38	50
	grams				145	290	435	145	290	435	145	290	435
	CEC				0	0	0	0	0	0	0	0	0
Peat Moss	Vol.	67	50	33	67	50	33	67	50	33	67	50	33
	grams	36	24	12	36	24	12	36	24	12	36	24	12
	CEC	40	26	13	40	26	13	40	26	13	40	26	13
Clay	Vol				8	12	17						
	grams				50	100	150						
	CEC				30	60	90						
Vermiculite	Vol							8	12	17			
	grams							4	8	12			
	CEC							6	12	18			
Terragreen	Vol										8	12	17
	grams										16	33	50
	CEC										9.6	19.8	30
Gr. Limestone	grams	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Gypsum	grams	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Total CEC	values.	40.0	26.0	13.0	70.0	86.0	103	46.0	38.0	31.0	49.6	45.8	43.0