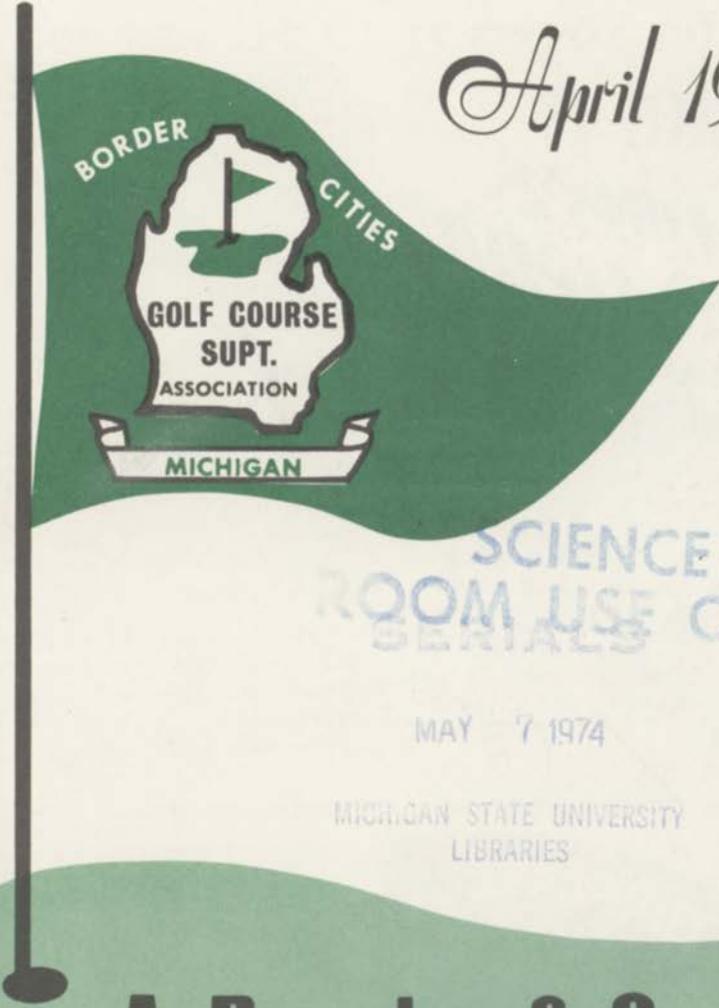


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Published monthly by the Michigan and
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Circulation 1,050

Ted Woehrle, Oakland Hills C.C.
Clem Wolfrom, Detroit Golf Club

Co-Editors

Blakeman Publications
Graphic Arts/Circulation

ADVERTISING RATES

Double Page Spread.....	\$100.00
Back Outside Page.....	65.00
Full Page.....	55.00
Half Page.....	35.00
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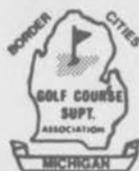
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A Challenge

It looks like the Michigan farmer is going to put enough pressure on the State Legislature to curtail the use of farm type fertilizer on golf courses and other non-agricultural turf areas.

As the fertilizer shortage worsens, we find ourselves facing a new problem; that of growing grass with less fertilizer than we have grown accustomed to.

My first reaction is to sit back and wait to see what happens. Let's see if there really is a shortage, after all many of the fertilizers that we presently use are not suitable for agriculture. These certainly will not be eliminated.

Perhaps the shortage is really not a shortage. It may only require a simple solution of redistribution of the basic elements.

Nitrogen and "mixed fertilizers" made up of Nitrogen, Phosphorus and Potash, are used heavily here in Michigan for agriculture and certainly the farmer is far more important to the well being of man than is the game of golf.

If the shortage is real, what can be done?

First and perhaps the most important thing we can do is analyze your soil for exact shortages of specific chemicals. Only apply the elements needed to correct the deficiencies found in your soil test. Do not waste fertilizer.

Cut down on Nitrogen use. Many golf course superintendents have found that less fertilizer sometimes produces healthier turf.

Begin a compost pile, create your own source of plant food. The grass

clippings and tree leaves mixed with soil and a little fertilizer will decompose and produce a rich mixture of organic matter for top dressing.

Less fertilizer will allow you to cut down on water use and this will allow you to cut down on mowing intervals which in turn will also conserve fuel for your tractors.

The *Poa annua* problem may also become less of a problem.

Fortunately, most of us have our summer's supply of fertilizer and we do not have to face the problem at this time.

We would be wise, however, to begin conserving our fertilizer in case this shortage is a real one.

See how many ways you can cut down on fertilizer and see how well the grass will do.

Sure, you might have more dollar spot but then again you may survive the heat stress much better.

Let's wait and see. We did it once before, we can do it again.

Good News

We are happy to hear that Clarence Wolfrom is back to work. Clarence went to the hospital for a short visit after he developed some lung congestion. I guess our bodies need a little attention once in a while (a 30,000 mile check up).

Ken Farr is on the mend back here in Michigan. Ken had an unfortunate accident while wintering in Florida. He is home now and experiencing some pain, but he is able to get around.

Pesticide Seminar I

The Golf Course Superintendent's Association of America presented its first series of Pesticide Seminars at the University of Illinois on March 19 and 20 and again at Michigan State University on March 27 and 28.

Twenty-nine Superintendents attended the Seminar in Illinois. There were Superintendents from Wisconsin, Iowa, Missouri, and Indiana in attendance as well as Illinois. Dr. Al Turgeon and his fellow staff members from Illinois did an outstanding job of conducting the Seminar. Such things as a history of pesticides, the metric system, measurements of small areas, calibration of equipment and crew safety were just several of the subjects covered.

Forty Superintendents attended the Seminar in Michigan with Superinten-



Dr. James Beard of MSU Turf School discussing Pesticide Seminar Program with Bill Madigan, Supt. of Jackson C.C.

dents attending from Minnesota, Wisconsin, Indiana and Ohio, as well as those from Michigan.

Besides the above mentioned subjects first aid, and chemical storage and disposal of chemical containers was discussed. OSHA and EPA regulations were also covered.

A short exam was given after each Seminar. From the looks of the results, the Superintendents did a good job of learning.

This Seminar was designed as a membership service to help the Superintendent understand the safe use of pesticides in today's environment.



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President's Message

Now that spring has sprung and all activities return to normal, let me just remind you that all committees in our association have been appointed. If you are approached to serve on a committee, please consider serving. Our Golf Day Chairman, Jim Vlassis, has set the date for our Annual Turf-grass Research Benefit and I am sure will be appointing committee chairman shortly. These chairmen will be soliciting help for the various committees. Remember that it requires total involvement by our association to have a successful day. Lets get involved, it takes you the member to make this day a success.

President
Jerry Gill

A New Concept in Insect Control

Dr. Howard Schneiderman of the University of California, at Irvine reported to a recent meeting of the Entomological Society of America that we can expect a new chemical to control insects.

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Ted Woehrle



is Re-elected

The annual meeting of the GCSAA was relatively calm, as meetings go.

A bright spot for the MBCGCSA was the re-election of Ted Woehrle as Director of the GCSAA for a two-year term. Bob Hope and Gerald Gill did an outstanding job soliciting the votes needed to get Ted re-elected.

Officers and Directors of the GCSAA elected at the annual meeting are listed below:

Charles Boskin from Connecticut was elected as President; Palmer Maples, Jr., from Georgia, is the Vice-President; and new Directors elected for two-year terms are: Charles Tadge, from Ohio; Melvin Lucas, Jr., from New York; and of course, Ted Woehrle from Michigan and the MBCGCSA.

Carl's Comments

Answers to March puzzle.



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Fertilization Practices and Soil Pollution

by JAMES R. WATSON, Ph.D.
Vice President, Customer Relations
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Pollution

A great deal of attention and publicity has been given to the subject of environmental pollution in recent years. Because some of this information has had little basis in fact and because there seems to be a tendency for the uninformed to transfer facts applicable to one environmental situation to another completely unrelated situation, it seems necessary to review various aspects of pollution in order to arrive at an acceptable understanding and definition of "soil pollution."

Pollute means to make unclean or to render impure or dirty. Thus, pollution implies the presence of impurities or "too much" of a substance or a material. This contaminated state or condition may be transitory, temporary or permanent.

Thus, air, water or soil may be polluted at any given time in any number of ways with a wide array of materials.

The "excess" connotation of pollution implies a standard or a base from which to measure. And, when one is dealing with a "pure" substance or a medium in which there is a recognized and acceptable level of known ingredients, "pollution" - an excessive amount of suspended material or an excess concentration of one or more harmful substances - may be readily identified, quantified and defined. In the case of water for drinking purposes, the soluble and the insoluble compounds may be identified and the concentration or amounts necessary to contaminate accurately quantified. Thus, if acceptable standards for the presence or absence of these ingredients have been established, any amount of an undesirable or potentially harmful compound in excess of the predetermined acceptable level would identify the water as "polluted" at that particular time.

The procedures for identifying and quantifying the contaminates or substances found in any volume of water, although perhaps complex, nevertheless are relatively uncomplicated and easy to determine and to understand. For example, the addition of a tablespoon of an impure or

Continued on Page 16



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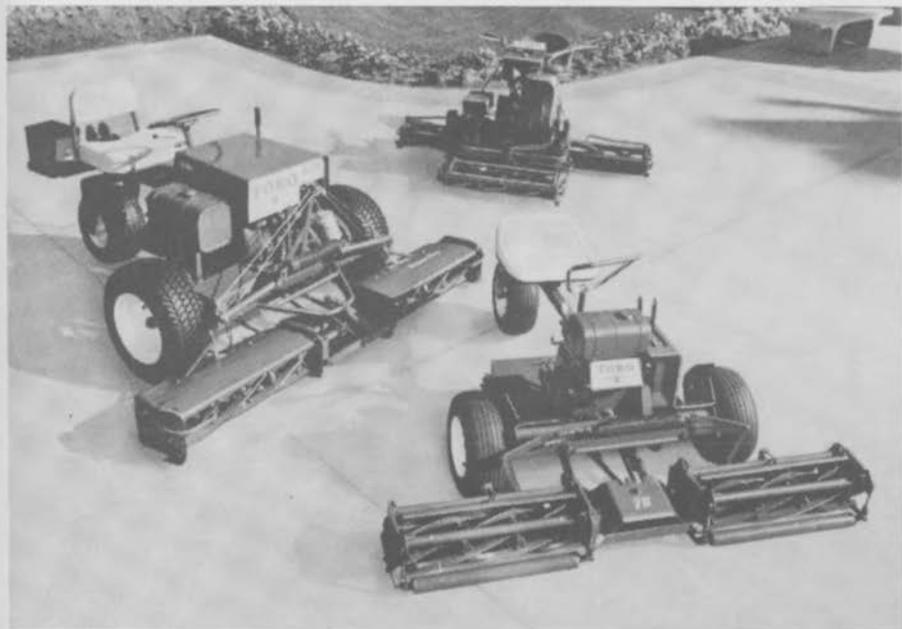
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The Fickle Weather

After breaking the high temperature records in early March, we were treated to a record low temperature in late March - on March 25 it went down to 3 degrees.

April quite often brings severe weather to the Midwest. Tornadoes are very common after a warm spell.

Excessive moisture continued to fall all during March.

Despite all the heavy snow during the winter, the turf came through the winter in excellent condition.

The grass began to green up early and it appeared that we would be mowing by March 20. As it turned out the grass turned off color and actually became dormant during the last week of March.

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Fertilizer Practices Cont.

offensive substance to a glass of "clean" water causes it to become undesirable as drinking water and, therefore, "polluted". However, this same glass of water could be completely satisfactory for turfgrass irrigation purposes. Thus, the concept of "use" for a particular purpose needs to be considered when discussing pollution.

Fertilizer Practices

Fertilization is the process of supplying plant nutrients to supplement the natural supplies of the soil. It is a necessary process and one of the key cultural techniques in golf course maintenance programs. The kind and the amount of fertilizer material, as well as the time and the frequency with which it is applied, are functions of the kind of grass, the soil, the climate, the weather, the season of the year, and the degree and extent of use to which the turf is

subjected. These factors, among others, influence and modify the basic fertilizer programs followed by today's golf course superintendent. Collectively, these procedures, programs and techniques may be called "fertilizer practices."

An extremist point of view could be that soil pollution results each time fertilizer practices on a golf course create an excess of one or more fertilizer materials or plant nutrients. Obviously, this is a totally unacceptable viewpoint to one who understands soils, fertilizer and plant growth. Nevertheless, it points up the fact that an acceptable definition of pollution must take into account the physical, chemical and biological properties of the medium to which or in which a material may be added. Soil and soil mixtures used to support golf course turfgrass are derived from widely variable parent materials which have been subjected to various soil forming processes. Thus, soil is a heterogeneous mixture of inorganic and organic compounds and living and dead organisms. For this reason, it is almost impossible to define or specify a "pure" base as may be done with water or air.

Soil Considerations

Soil is dynamic. It contains large numbers of living organisms, each with individual requirements and demands. As these are satisfied, physical and chemical changes occur.

Continued on Page 19

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A Golf Course Fairy Tale

Once upon a time there was a superintendent who had the perfect golf course. His course was so perfect that all the grass was watered fence to fence and every blade of grass was well fertilized and cut to just the right height. There were no clumps of tall grass or other unkept places where a golfer could lose a ball. Even the edges of the traps were sharp and clean.

All the members of the club were very happy because they could play sloppy golf and still score well because the rough was short and the greens were lush and very soft. But there was an uneasiness in the land and many of the golfers became bored.

One dark day a strange phenomenon came over the land. Energy had to be conserved. Fertilizer was high in cost and very hard to get. What was the superintendent to do? Despite all his valiant efforts to keep up the course in the usual way it became evident that some of the grooming would have to suffer.

In time things were so bad that the superintendent had to mow less, fertilizer less, and pump less water for irrigation. As a result the roughs were kept at a higher cut. The greens

were pale from lack of the high nitrogen program and firm from the lack of overwatering. The sand trap edges were hand cycled in the old fashion way to save on gasoline. The golfers soon found they were playing a different type of golf course. They had to hit their drives straighter because poor shots were penalized by landing in long rough or were lost. They could no longer putt out of the traps. Much to their surprise, however, the greens putted better than ever. There was no puffiness from over fertilizing and the blades of grass were finer and stiffer. Holding a shot on the green was harder to do, so many golfers had to use more finesse around the greens.

Much to the surprise of the superintendent all that talk about trying to make the course longer stopped. The golfers came to find out that a course does not have to be long to be good. Some of the well traveled golfers commented the course resembled some of the fine features they had seen in Scottish golf courses.

Even after the energy crisis passed the golfers decided their course was better than before and lived to play it happily ever after.

Stan Metsker



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Fertilizer Practices Cont.

In addition, the interplay of physical and chemical processes produce change in the inorganic constituents. The soil is a medium in which there is continual change. A static or fixed situation seldom, if ever, exists under field conditions. Materials added in amounts or concentrations immediately toxic or deleterious to one or more organisms may be beneficial to another. And, in the process of utilization, these compounds may be reduced to non-toxic levels or converted to harmless materials. Thus, from a practical standpoint the concept of time and physical, chemical and biological degradation or abatement must be considered.

Fertilization

In the case of turfgrass fertilization, the application of fertilizer materials greater than can be used by the permanent grass is not necessarily detrimental. Plant nutrients must be present in the soil solution before they can be absorbed and utilized by the grass roots. If this does not occur in the upper layers or zones, the material may move downward through the profile in solution. As this solution moves through the root zone, the unused nutrients, especially nitrogen, may be picked up by other plants, animals or micro-organisms. In this manner, the nutrients may become available to the permanent grass at a later date. As long as the excess material is not toxic to the grass root - and, specifically to the roots of the permanent grass being cultured or grown - its presence should not brand it as a pollutant. If, however, the excess cannot be adsorbed or absorbed, used, or converted to a harmless state, and it moves through the soil and finds its way into the ground water or into reservoirs, lakes, streams or rivers, its presence may cause it to be classified as an impurity or undesirable agent.

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Fertilizer Practices Cont.

The characteristics of the individual fertilizer elements and the manner in which they are adsorbed, held and released by the colloidal complex control, in part, their potential for becoming a polluting agent.

Nitrogen is taken into the plant root as the nitrate ion. In this form it is highly mobile, is not adsorbed by the colloidal complex and moves freely in the soil water. Nitrogenous fertilizer materials are of two forms - inorganic and organic.

The inorganic sources are soluble and readily available. The ammonium forms (ammonium sulfate and ammonium nitrate) are subject to dissolution when applied to turf areas. Ammonium nitrogen is initially adsorbed by the soil complex. However, it is rapidly converted to the nitrate form by the nitrifying bacteria. Urea, although chemically an organic compound, breaks down easily and is readily

converted to the ammonium and subsequently to the nitrate form.

The natural organics (sewage sludge, etc.) and the organic portion of the synthetic organics (ureaformaldehyde, etc.) are dependent upon microbial activity for their breakdown and conversion to the nitrate form. This process takes a longer period of time and, most importantly, causes the release of nitrogen to occur over a longer period of time.

Coated slow release fertilizer materials represent a third category of products. They are dependent on hydrolytic action for initial release of nitrogen and the other nutrients they may contain. Once dissolved and released, their behavior follows the pattern already described.

This difference - in the rapidity with which the nitrogen carrier is converted to the nitrate form and reaches the soil solution - is a basic

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Fertilizer Practices Cont.

consideration governing sound fertilizer practices. It is a key point in controlling the potential for nitrate pollution. Soluble forms of nitrogen must be used more frequently and in smaller amounts than organic forms, or nitrate may leach. Likewise, watering practices must be keyed to the texture, structure and porosity of the soil. These factors control the infiltration and percolation rates, the waterholding capacity and, in part, the drainage characteristics of a given soil. Excess water moving through the root zone will cause excess leaching of nitrogen, and, under some conditions, will produce erosion through surface runoff. Controlled automatic irrigation thus becomes a key technique for minimizing pollution.

Phosphorus is held tightly by the soil colloidal complex and moves downward from its point of application only very lightly. Even when applied in soluble forms (mono-calcium and ammonium phosphates) it reacts quickly and is converted to less soluble forms (di- or tri-calcium phosphates). Soil phosphorus becomes available very slowly and tends to accumulate near the surface.

Phosphorus is lost primarily through erosion - the soil particle to which it is attached is transported by water or wind over the soil surface.

Potash fertilizers are soluble. They dissociate readily and the potassium ion is adsorbed near the point of application. Potassium, unlike ammonium, is held tightly by the colloidal complex and it becomes relatively immobile. It becomes available to plant roots through the process of base exchange and is rarely lost by leaching.

"Fertilizer Practices and Soil Pollution" will be continued in the May issue of **A PATCH OF GREEN.**

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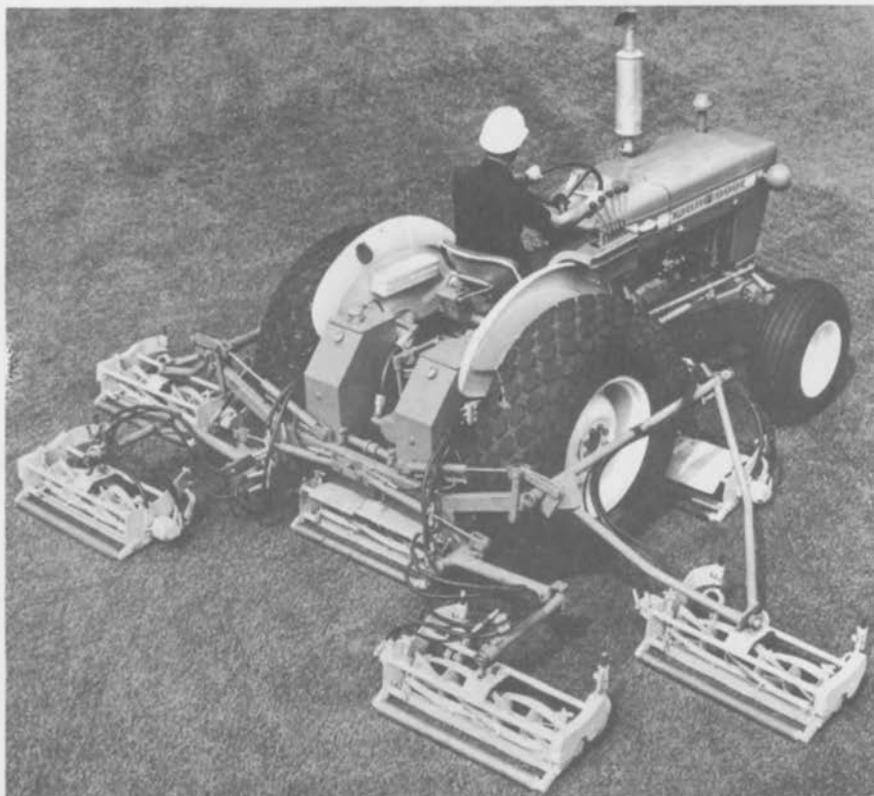
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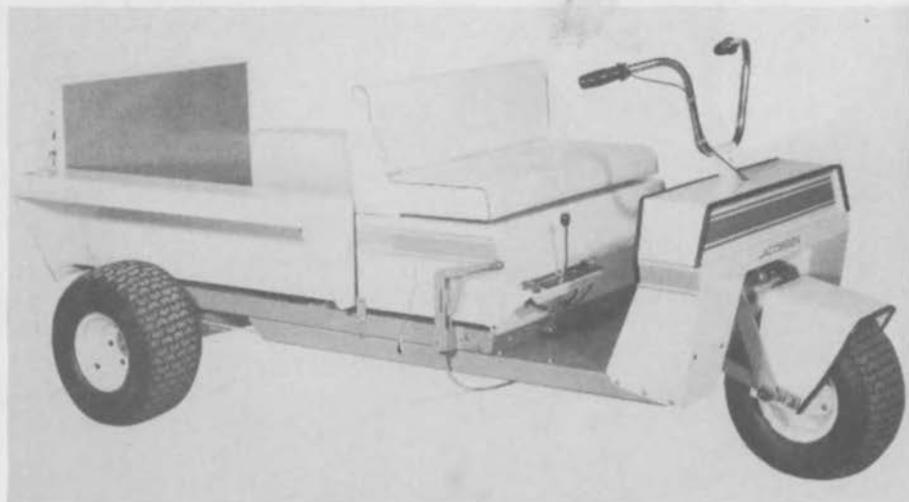
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POWER & DRIVES:

Transmission: 2 speed APEX gear type

GENERAL:

Weight- Complete: No load - 830 lbs.

Fuel Capacity, Type: 3 gal., regular

Seating Capacity: 2 - side by side

Tailgate: Folding ramp style

DIMENSIONS:

Length 111 in, Height 42 in, Width 62 in.

PERFORMANCE:

Turning Radius: 0 in. inside, 88 in. outside

Forward Speed: 1st gear - 4.8 MPH

Forward Speed: 2nd gear - 12.5 MPH

Reverse Speed: 5.4 MPH

Box Capacity: Volume - 11 cu. ft.

Box Capacity: Weight - 1000 lbs.

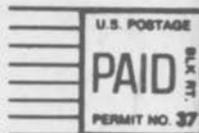
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