

Potassium (K), as potash, increases the formation of starch, stiffens the stems and probably aids the turf in its resistance to diseases. Potash salts are very caustic and liable to burn the grass leaves. Very little potash is lost by leaching, and comparatively little used by the growing turf. Clover and weeds are favored by its excessive use.

Fertilizers should be purchased according to the price per pound of plant food, and not according to the price per ton of mixed fertilizer. To be able to do this one must understand the label analysis which is required by nearly every state in the whole United States. Such a label guarantees that a certain percentage of the fertilizer is available nitrogen (N) or ammonia (NH_3), phosphorus (P) or potassium (K). Example a 6-8-6 mixture means 6% ammonia, 8% phosphorus and 6% potassium; or in 100 lbs. of the fertilizer, 20 lbs. is available as plant food in the indicated proportions. The remainder (80 lbs.) is filler composed of harmless materials. If the price of such a mixture was quoted at \$80 per ton, the plant food would cost 20c per pound.

Having discussed at considerable length the plant food elements, let us consider the grasses themselves and their particular needs.

Bents prefer acid conditions, and many species produce stolons.

Blue grasses prefer alkaline conditions.

Fescues prefer slightly acid conditions and have much less leaf development.

WEEDS DO NOT LIKE ACID SOILS

WEEEDS do not thrive on acid soils because active aluminum is made available by the acid condition. Aluminum is toxic to weeds.

Clovers and weeds will successfully compete against grasses on alkaline soils and those containing much phosphorus and potash.

The weedless lawn formula was developed over twenty years ago by Dr. Burt L. Hartwell while he was Director of the Rhode Island Experiment Station. The formula is arrived at by mixing equal parts of sulphate of ammonia, superphosphate and muriate of potash. The rate of application is 750 pounds of the mixture per acre, or 17 pounds per 1000 square feet.

Southern lawn grasses do well in slightly acid soil, and cottonseed meal appears to be excellent for Bermuda grass.

USE LIME SPARINGLY

IN TURF culture, lime should be used only when it is deemed necessary to increase the calcium and magnesium content of the soil, or to correct acidity, or in the case of clay soils to assist bacterial action. If lime is used in a quantity over 40 lbs. per 1000 square feet it will very likely cause an invasion of clover.

Fertilizers should be applied when the grass is dry those that are caustic should be thoroughly worked into the soil by a heavy sprinkling. During the washing process, if possible avoid walking on the wet lawn. The great liability of burning the grass is the only objection to the Rhode Island formula. Spreading fertilizer in the rain is safe provided the storm lasts long enough to wash the solution from the leaves.

If one has screened compost, the caustic fertilizers may be mixed with it at the rate of from five to eight pounds per cubic yard of compost. Such a mixture will be much more effective if allowed to remain in the pile for a week before applying to the lawn, and it should then be applied at a rate sufficiently heavy to assure the proper amount of fertilizer per square unit.

The frequently clipped lawn should have three applications of fertilizer each year. The first in the spring after the young shoots have become hardened, a second about June 1, and a third in early September if there is little danger of loss from leaching.

Poultry manure if taken from the dropping boards and composted with sand for six months is an excellent lawn fertilizer. It should be applied at the rate of 25 lbs. per 1000 square feet.

COMMERCIAL LAWN FERTILIZERS ARE GOOD

MUCH is to be said in favor of the ready-mixed commercial lawn fertilizers. First they are sold in convenient packages (10 lbs. and up). Second, they have a guaranteed analysis the same as all fertilizers. Third, they are usually mixed, so that their plant food is made slowly available and therefore lasting over a long period of time. Fourth, if used according to directions there is very little liability of burning the grass, and fifth, they can be used on shrubs and flower beds without harm.

As an increase in the amount of quickly available nitrogen in a commercial mixture would give cause

TABLE VIII—SAFE AND RELIABLE FERTILIZERS.
RATES PER 1,000 SQUARE FEET

Spring	June	Fall
1. Ammonium sulphate, 5 lbs., and Castor bean pomace 21 lbs.	1. Same as spring	1. Castor Bean pomace, 21 lbs. or Cottonseed meal 16 lbs.
or Cottonseed meal 16 lbs.	2. Same as spring	2. Bone meal 10 lbs.
2. Ammonium sulphate, 5 lbs., and Bone meal, 10 lbs.		

Number 1 for bents and fescues, Number 2 for blue grasses.

for caution in spreading, because of the liability of burning the grass the practical agrostologist accepts the commercial fertilizer ratios as safe and sane, even though not ideal. The home owner who knows how to use ammonium sulphate can have an excellent lawn fertilizer by using it as a supplement to a commercial mixture.

WARNING!

IF THE directions say use 10 lbs. per 1000 square feet don't use any more; many a good lawn has been ruined because the owner or caretaker thought that if a 10-pound application was good a 20-pound application would be excellent.

Golf Course News

*A column of information brief and accurate.
Items are welcome and will be published.*

FROM THE SOUTH

By MERLE ZWEIFEL

WHEN Jay C. Painter, Secretary of the Oklahoma State Golf Association calls greenkeepers together next month to arrange the organization of a state greenkeepers' Association, he apparently is arranging a "new deal" for greenkeepers of the oil country.

The proposed organization will be entirely independent of other groups and its aims will be very much established by the fact that Green chairmen of every golf club in the state will be given an opportunity to join the association as regular members. Mr. Painter believes that by enrolling Green chairmen he will contact many interesting discussions regarding turf culture at proposed future meetings and it will offer an excellent chance to give club officials an idea of what greenkeepers are up against with slashed budgets and their strug-

gle to maintain a good golf course for golf club members. Several Green chairmen have offered their support of such an organization.

* * *

The city of Rogers, Arkansas, in the heart of the Ozarks, will soon be listed among the leading resort cities of the nation if plans of a group of Jersey City promoters are accomplished. Site has been chosen and finances have been arranged for the construction of a magnificent resort hotel together with a thirty-six hole golf course with grass greens and work on the project is to begin by September 1, 1933. Ozark mineral waters with their healing properties are to be the main drawing card.

NEW ENGLAND NOTES

By GUY WEST

THE June meeting of the Greenkeepers' Club of New England was held at the Kittansett Club, Marion, Mass., on June 5. There was an attendance of over a hundred members and guests. The Kittansett Club also invited to this meeting the Green chairmen of clubs whose greenkeepers are members of the Greenkeepers' Club, and provided an additional prize to those presented by the Club. This Kittansett Club is a beautiful course near Cape Cod, and is in fine shape.

Several wives of members also attended this meeting, and were escorted by Mrs. Pierce, wife of Greenkeeper Elliot D. Pierce, to several of the fine estates around Marion.

The tournament season is now on in full swing, and any player wishing to play in a tournament can take his choice of three or four practically any week. Courses in general are in good condition, a little on the dry side at present, with little brown-patch reported as yet. The cuts in course budgets have in most cases meant fewer men, but most greenkeepers are succeeding in getting the essential things done, and leaving undone from necessity the least important items.

* * *

THE Rhode Island Greenkeepers' Association held its monthly meeting on June 19 at the Metacomet Golf Club, East Providence, R. I.

CREeping BENT TURF WITHSTANDS HEAT WAVE

Countless greens were ruined in the severe heat waves before July 4th, but Illinois Grass Co.'s True Washington Strain Creeping Bent stood this trying period with little or no damage. Used by hundreds of greenkeepers, golf and country clubs, etc., in solid turf form. Furnished in rolls ready to lay down like a carpet. Guaranteed quality. Available in stolons also. We grow Blue Grass sod, too.

Write today for prices and samples.

ILLINOIS GRASS CO.

Department 402

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J. A. Carter, Sales Agent, 75 E. Wacker Drive . . . Chicago

Trade News About Turf Culture

EMMETSBURG, IOWA

The citizens of Humboldt have created a new park to be known as "Iowa Park." It is located at the site of the new water station on the west fork of the Des Moines river west of town. The landscaping of the park has already been taken over by the Humboldt Garden club and it promises to be one of the prettiest parts of the city.

* * *

FINDLAY, OHIO

Improvements have been started on the building at the Rummell airport on the Dixie highway at the edge of the west city limits.

The landing field is being surveyed with the expectations of some grading and other changes to be made in the near future.

* * *

ALBIA, IOWA

Probably a good many people of the state think that the land about Spirit Lake is already a state park, but such is not the case. There has, however, been an agitation at the city of Spirit Lake for a good many years for the location of a state park near to that place, and this ambition is now to be realized.

Ray Murray, Iowa secretary of agriculture is in charge.

* * *

STAMFORD, CONN.

First Selectman Oscar D. Tuthill, has obtained permission to beautify the park surrounding the pond in the Hub, Cos Cob, known as the Indian Cemetery Park.

Mr. Tuthill outlined the landscaping of the park, which would be done by unemployed receiving town relief, and under the supervision of the park superintendent, Edward Palmer.

* * *

NEW HAMPTON, IOWA

The new Park Commissioners of New Hampton, John Crawford, Walter Kelson and Francis Kennedy, have undertaken a Park Improvement Program for the city that is most interesting.

They have had a landscape architect draw plans, and for two weeks have had a force of men at work.

* * *

ESCANABA, MICH.

Work of establishing a large landing field, to meet with government rating requirements, was begun this week at Nahma. J. P. Cameron, chairman of the Delta county board of supervisors, is in charge.

Mr. Cameron looks forward to use of the Nahma airport by hunting and fishing parties from Chicago, lower Michigan and other distant points. Nahma is in the heart of a great game country, and the establishment of a landing field there will encourage sportsmen to make hurry-up excursions to that region.

* * *

UTICA, NEW YORK

Dedication of Lawncrest Memorial Park, a new cemetery on Seneca Turnpike a mile beyond Yahnundasis Golf Club, was conducted recently. M. J. Fleeman, representing the promoters, Sexton-Fleeman organization, First Bank Building.

STUART, IOWA

Through an arrangement completed at a meeting of the Adel Golf club Monday night, Frank Donovan, one of the best known Iowa professionals leased the local course and plans to give it his personal attention throughout the coming summer.

Under the terms of the agreement the grounds and equipment are turned over to Mr. Donovan. He will put the greens and fairways in the best of condition, establish a shop for the sale of golfers supplies and the repairing of clubs, etc., and operate the course under a greens fee basis.

* * *

AKRON, OHIO

The Cleveland Metropolitan Park board began a survey Tuesday to determine feasibility of the proposal by Mayor C. Nelson Sparks that the Cuyahoga river valley through Geauga, Portage, Summit and Cuyahoga counties be improved, as a work-relief project.

Fred E. Clemmer, Akron service director, conferred with the Cleveland group, and was supported by H. S. Wagner, secretary-director of the Akron Metropolitan Park board.

* * *

SYRACUSE, NEW YORK

The State Conservation Department has been given \$12,000 by the State Temporary Emergency Relief Administration for continuing the work in Green Lake State Park. The State College of Forestry at Syracuse University gets an additional \$4,500 for work projects there.

* * *

SIOUX, IOWA

Under the management of Bon Myers, widely known Sioux City golfer, the old Riverside Boat club course has been converted into public links and will be ready for play soon.

As the seventh public course in the Sioux City environs, it will be a nine-hole layout, 2750 yards in length with a par 34 and sand greens.

* * *

LUDINGTON, MICHIGAN

George W. Olcott of Chicago, landscape architect attached to the National Park service, has some time spent studying the layout of Ludington state park, preparatory to establishing a final plan for its development.

National Park service is the federal authority supervising Civilian Conservation corps work in all national and state parks. Mr. Olcott expects to confer with P. J. Hoffmaster, state park commissioner at Lansing, regarding final landscaping plans for the local park.

* * *

LAKE PARK, IOWA

The state of Iowa will establish a new park here this summer, the board of conservation having accepted a tract of 57 acres on Silver lake from the Travelers Insurance company of Hartford, Conn.

* * *

LOS ANGELES, CALIFORNIA

Establishment of a municipal airport on city property adjoining Griffith Park, near the National Guard airfield, will be

another Federal aid project to be fostered by Mayor-elect Frank L. Shaw.

Such an airport would be only a few minutes from downtown Los Angeles, Shaw pointed out, and would facilitate the handling of mail and passengers.

There are 165 acres available for the field, Shaw said, and it could be established by the use of Federal funds, as a self-liquidating project, and would afford employment for a number of men.

* * *

PORTLAND, INDIANA

Several persons appeared before the city council, asking that the city assist in the establishing of a municipal airport. It was proposed that the city take over the Brigham field, which can be put in good condition at a small cost. A committee was appointed by Mayor C. V. Gott, composed of Councilmen James Bickel, Ray Teeters and George Ehrhart, to investigate the proposition.

* * *

TIPTON, INDIANA

Plans for improvements to Tipton county's beautiful park, which will make it one of the most complete recreation spots in the state.

Options have been taken on the Hall land, known as the old fair grounds, and the Board of Commissioners has given an option on a small strip of ground adjacent to the Hall land for the golf course.

* * *

NEW YORK CITY, N. Y.

Before the end of June the work of restoring Bryant Park to the state it enjoyed before the Washington Bicentennial Commission took over a large share of it for the erection of the Federal Hall reproduction will be well on its way, is announced by John M. Hart, deputy park commissioner.

* * *

HOLLAND, MICH.

The mayor and common council were very enthusiastic relative to a proposal made by the state department of Lansing, through the director, Floyd Evans, asking that Holland provide not a large but a suitable landing field for flyers.

Holland is in direct line with Grand Rapids and Milwaukee and the field for emergency landing is way off the beaten path at West Olive.

* * *

SAVANNA, ILLINOIS

Word has been received here of the appointment of Arnold E. Roehl, former Wausau resident, as superintendent of construction of the Mississippi Palisades state park at Savanna, Ill.

* * *

NEWARK, NEW YORK

The work of E. D. Colburn, village trustee, during the past several years was rewarded Thursday night at the special meeting of the village board, when the board voted to carry out the proposed plan to take over about twenty-one acres of State property and plant it with trees for a park and name it "Colburn Park." The land is located at the east end of the village along the old Erie Canal.

* * *

NORRISTOWN, PA.

The new Bocce course of the Italian Citizens Club was opened recently.

Book Reviews

Soil Management for Greenkeepers

A VERY splendid book has just come from the press of W. E. Humphrey, Geneva, New York. It is edited by M. H. Cubbon, Ph.D. Assistant Professor of Agronomy, Mass. State College, and M. J. Markuson, B.S. of Architecture, Assistant Professor of Agricultural Engineering, Mass. State College, at Amherst, Mass.

The book is published in two parts. First by Doctor Cubbon, covering the make-up of soils, fundamentals of chemistry, plant nutrients and soil acidity. The author goes on to analyze the effects of organic matter in soils, nitrogen changes and the general consideration of fertilizers. This subject is defined more specifically in chapters covering the fertilization of golf greens and fairways. Finally, he covers the use of weed killers and other poisons with special emphasis on the effect of mercurial compounds.

Doctor Markuson devotes his section almost exclusively to Drainage, which as everyone knows, is tremendously important in the preparation of soil structure. He is an authority on this subject and has had a great deal of engineering experience. We take the liberty of quoting the introduction to his section,

"The proper drainage for golf courses can best be accomplished by utilizing accepted engineering practices to fit each peculiar condition. It is very seldom that two areas will present the same conditions, making it therefore imperative to study each as an individual problem. Common sense methods and the designing of the simplest possible means to remove surplus water will, in the long run, prove more satisfying than complicated affairs.

"Since it is the excessive surplus water which causes trouble, it becomes necessary to remove that. Practically every type of soil will retain, in spite of drainage, all of the water which it needs. This retained moisture is called capillary water and any water not needed for that purpose becomes surplus; and wherever the surplus exists in such quantities as to interfere with plant growth or use of the land, it is, as a rule, comparatively simple to remove.

"If water is present in large amounts, it fills the air spaces and stops plant roots from seeking food at greater depths. Then in a dry year the plants are not able to adjust themselves quickly enough to get necessary moisture for normal growth. Continuous tramping over a wet area produces a hard impervious condition which discourages plant growth. This action is called puddling. If air is present, the puddling process is not serious."

Readers of the NATIONAL GREENKEEPER AND TURF CULTURE may receive a copy by writing to us or the authors. The price is \$2.00.

Market Place *and* Buyers' Guide

Where reputable manufacturers and dealers list and describe their products. Greenkeepers are requested to write the Market Place for any special information they desire about supplies or equipment.

Names and Addresses of Leading Manufacturers and Dealers in the Turf Culture Field

Royal Products Company, 214-216 S. Charles St., Baltimore, Maryland.
J. Oliver Johnson, Inc., Morgan-Huron-Superior Streets, Chicago, Illinois.
Worthington Mower Company, Stroudsburg, Pennsylvania.
Ideal Power Lawn Mower Company, Lansing, Michigan.
G. B. Lewis Company, Watertown, Wisconsin.
J. M. McCullough's Sons Company, 316 Walnut Street, Cincinnati, Ohio.
Seaside Bent Company, 115 Broad Street, New York City, New York.
Stumpp & Walter Company, 132-138 Church Street (at Warren St.), New York City, New York.
Peter Henderson & Company, 35 Cortlandt Street, New York City, New York.
O. M. Scott & Sons Company, Marysville, Ohio.
Ohio Humus Products Company, London, Ohio.
Illinois Grass Company, 75 E. Wacker Drive, Chicago, Illinois.
Lyman Carrier Products, Granger, Indiana.
J. G. Peppard Seed Company, Kansas City, Missouri.
American Cyanamid Sales Company, 535 Fifth Avenue, New York City, New York.
C. B. Dolge Company, Westport, Connecticut.
McClain Bros. Company, Canton, Ohio.
Arthur Boggs & Company, Willoughby, Ohio.
Mallinckrodt Chemical Works, 2nd and Mallinckrodt Streets, Saint Louis, Missouri.
Cleveland Charcoal Supply Co., 3905 Jennings Road, Cleveland, Ohio.
Wood Charcoal Research Bureau, P. O. Box 356, Jacksonville, Florida.
Royer Foundry & Machine Company, 158 Pringle Street, Kingston Station, Wilkes-Barre, Pennsylvania.
Kemp Mfg. Company, Erie, Pennsylvania.
John H. Graham & Co., Inc., 113 N. Chambers Street, New York City, New York.
Synthetic Nitrogen Products Corp., 285 Madison Avenue, New York City, New York.
Armour Fertilizer Works, Atlanta, Georgia.
Buckner Mfg. Company, Fresno, California.
Campbell Irrigation Company, Woodbury, New Jersey.
Economy Irrigation Company, Seattle, Washington.
L. R. Nelson Mfg. Company, Peoria, Illinois.

The Budd Mfg. Company, Ravenna, Ohio.
Double Rotary Sprinkler Company, 109 Coca Cola Bldg., Kansas City, Missouri.
Pennsylvania Lawn Mower Works, Primos, Delaware County, Pennsylvania.
E. G. Staude Mak-A-Tractor Company, 2630 University Avenue, St. Paul, Minnesota.
The F. & N. Lawn Mower Company, Richmond, Indiana.
National Mower Company, 839 Cromwell, St. Paul, Minnesota.
International Harvester Co. of America, 606 South Michigan Avenue, Chicago, Illinois.
Milwaukee Sewerage Commission, P. O. Box 2079, Milwaukee, Wisconsin.
Nitrate Agencies Company, 104 Pearl Street, New York City, New York.
Atkins & Durbrow, Inc., 165 John Street, New York City, New York.
Bayer-Semesan Company, Wilmington, Delaware.
Standard Mfg. Company, Cedar Falls, Iowa.
Sherwin-Williams Company, 601 Canal Road, N. W., Cleveland, Ohio.
T. W. Wood & Sons, 11 South 14th Street, Richmond, Virginia.
Perfection Sprinkler Company, Plymouth, Michigan.
Roseman Tractor Mower Company, 810 Church Street, Evanston, Illinois.
Hyper-Humus Company, Newton, New Jersey.
Jacobsen Mfg. Company, Racine, Wisconsin.
Henry A. Dreer, 1306 Spring Garden Street, Philadelphia, Pennsylvania.
A. N. Peckham, Kingston, Rhode Island.
Philadelphia Seed Company, 103-105 Arch Street, Philadelphia, Pennsylvania.
Fate-Root-Heath Company, 833-869 Bell Street, Plymouth, Ohio.
Henry H. Doty, 238 Central Avenue, Highland Park, Illinois.
Walter B. Helms, Inc., 237 South Jackson Street, Lima, Ohio.
J. F. Buel, Woburn, Massachusetts.
Hardie Mfg. Company, Hudson, Michigan.
Friend Mfg. Company, Gasport, New York.
Diamond-Calk Horseshoe Company, Duluth, Minnesota.
R. S. Horner, 61 Eagle Street, Geneva, Ohio.
Reade Mfg. Company, Jersey City, New Jersey.

Ant Control

Royal Products Company

Ball Washers

J. Oliver Johnson, Inc.
 Worthington Mower Company
 Ideal Power Lawn Mower Co.
 G. B. Lewis Company

Ball Locators

Worthington Mower Company

Bent-Coos County State Sealed and Certified

J. M. McCullough's Sons Company
 Seaside Bent Company

Bent Seed

Stumpp & Walter Company
 Peter Henderson & Co.
 O. M. Scott & Sons Co.
 Hyper-Humus Co.

Bent Seed—Prince Edward Island

J. M. McCullough's Sons Co.

Bent Stolons

O. M. Scott & Sons Co.
 Stumpp & Walter Co.
 Ohio Humus Products Co.
 Illinois Grass Co.
 Lyman Carrier Products

Bluegrass—Seed

J. G. Peppard Seed Company

Brown Patch Control

Stumpp & Walter Co.
 J. Oliver Johnson, Inc.
 American Cyanamid Sales Co.
 C. B. Dolge Company
 McClain Bros. Co.
 Arthur Boggs & Co.
 Mallinckrodt Chemical Works
 Lyman Carrier Products

Charcoal

Cleveland Charcoal Supply Company
 Wood Charcoal Research Bureau

Cocoas

Lyman Carrier Products

Compost Distributors

Toro Mfg. Company

Compost Mixers

Toro Mfg. Company
 Royer Foundry & Machine Co.
 Kemp Mfg. Company

Cultivators (Disc)

John H. Graham & Co., Inc.

Cultivators (Spike)

John H. Graham & Co., Inc.

Dump Carts

Toro Mfg. Company
J. Oliver Johnson, Inc.
Worthington Mower Company
Peter Henderson & Co.
Ideal Power Lawn Mower Co.

Fairway Fertilizers

Synthetic Nitrogen Products Corp.
Armour Fertilizer Works
Lyman Carrier Products

Fairway Irrigation

Buckner Mfg. Co.
Campbell Irrigation Company
Economy Irrigation Company
L. R. Nelson Mfg. Company
Double Rotary Sprinkler Co.
Lyman Carrier Products

Fairway Mower Blades

The Budd Mfg. Company

Fairway Mowers

Pennsylvania Lawn Mower Works
Toro Mfg. Company
E. G. Staude Mak-A-Tractor Co.
Ideal Power Lawn Mower Company
Worthington Mower Company
The F. & N. Lawn Mower Co.
National Mower Company

Fairway Tractors

International Harvester Co. of America

Fertilizers

Milwaukee Sewerage Commission
J. Oliver Johnson, Inc.
Peter Henderson & Co.
Nitrate Agencies Co.
Atkins & Durbrow, Inc.
American Cyanamid and Chemical Corp.
Lyman Carrier Company
Bayer-Semesan Company
Synthetic Nitrogen Products
Armour Fertilizer Works

Fertilizer Distributors

International Harvester Co. of America
Synthetic Nitrogen Products Corp.

Flag Poles

Ideal Power Lawn Mower Company
Standard Mfg. Company

Flexible Steel Mats

J. Oliver Johnson, Inc.

Fungicides

Bayer-Semesan Company, Inc.
Sherwin-Williams Company
Mallinckrodt Chemical Works

Fairway Rollers

Toro Mfg. Company
Worthington Mower Company

Golf Course Construction

Ohio Humus Products Co.

Golf Equipment

Stumpp & Walter Co.
Peter Henderson & Co.
Ideal Power Lawn Mower Company
T. W. Wood and Sons
Worthington Mower Company

Golf Flags

Ideal Power Lawn Mower Company
Stumpp & Walter Company
Peter Henderson & Co.

Greens Fertilizers

Armour Fertilizer Works
Synthetic Nitrogen Products Corp.
Lyman Carrier Products

Greens Sprinklers

L. R. Nelson Mfg. Co.
Buckner Mfg. Co.
Double Rotary Sprinkler Co.
Perfection Sprinkler Co.

Hand Mower Blades

Budd Mfg. Company

Hole Cups

Standard Mfg. Company

Hole Cutters

Ideal Power Lawn Mower Company
Standard Mfg. Company

Hole Rims

Ideal Power Lawn Mower Co.

Horse Drawn Mowers

Pennsylvania Lawn Mower Works
International Harvester Co. of America
Worthington Mower Company
Ideal Power Lawn Mower Co.
Roseman Tractor Mower Co.

Hose

Peter Henderson & Co.

Humus

Hyper-Humus Company
Ohio Humus Products Co.
Peter Henderson & Co.
Atkins & Durbrow, Inc.

Hydro-Mixer

McClain Brothers Company

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GENEVA OHIO

Insecticides and Fungicides

American Cyanamid and Chemical Corp.
Sherwin-Williams Company
Bayer-Semesan Company
Arthur Boggs & Co.
Mallinckrodt Chemical Works

Lawn Mowers

Pennsylvania Lawn Mower Works
Toro Manufacturing Company
Worthington Mower Company
Ideal Power Lawn Mower Co.
The F. & N. Lawn Mower Co.
Jacobsen Manufacturing Company

Lawn Seed

Henry A. Dreer
O. M. Scott & Sons Co.
J. Oliver Johnson, Inc.
Stumpp & Walter Co.
A. N. Peckham
Peter Henderson & Co.
J. M. McCullough's Sons Co.
Illinois Grass Co.
Philadelphia Seed Co.
Seaside Bent Company
Lyman Carrier Products

Lime Spreaders

International Harvester Co. of America

Marvel Turf Conditioner

Walter B. Helms, Inc.

Mower Blades

The Budd Mfg. Co.

Mowing Equipment

E. G. Staude Mak-A-Tractor Co.
Toro Mfg. Company
Pennsylvania Lawn Mower Works
Ideal Power Lawn Mower Co.
Worthington Mower Company
International Harvester Co. of America
Roseman Tractor Mower Co.
The F. & N. Lawn Mower Co.
Jacobsen Mfg. Company
National Mower Company

Motor Trucks

International Harvester Co. of America

Market Place and Buyers' Guide---

Mower Sharpeners

Fate-Root-Heath Company
Toro Manufacturing Company
Henry H. Doty

Nitrophoska

Synthetic Nitrogen Products Corp.

Peat Moss

Atkins & Durbrow, Inc.

Perforator

J. F. Buel

Poa Annua

J. M. McCullough's Sons Co.

Power Mowers

Cooper Mfg. Company
Toro Manufacturing Company
Worthington Mower Company
International Harvester Co. of America
Jacobsen Mfg. Company
Ideal Power Lawn Mower Company

Putting Green Mowers

Toro Mfg. Company
Pennsylvania Lawn Mower Works
Worthington Mower Company
Ideal Power Lawn Mower Co.
Roseman Tractor Mower Co.
The F. & N. Lawn Mower Co.
Jacobsen Mfg. Company

Power Putting Green Mowers

Jacobsen Mfg. Company
Worthington Mower Company
Ideal Power Lawn Mower Co.

Rakes

Pennsylvania Lawn Mower Works

Rhode Island Bent Seed

A. N. Peckham

Rollers (Hand)

John H. Graham & Co., Inc.
Stumpp & Walter Company

Rollers (Fairway)

John H. Graham & Co., Inc.
Toro Mfg. Company
Worthington Mower Company

Rollers

Stumpp & Walter Company
Toro Mfg. Company
Worthington Mower Company

Rough Mowers

Toro Manufacturing Company
Pennsylvania Lawn Mower Works
Worthington Mower Company
Ideal Power Lawn Mower Co.
Roseman Tractor Mower Co.
Jacobsen Mfg. Company
International Harvester Co. of America

Seaside Bent

Seaside Bent Company
Lyman Carrier Products

Shower Nozzle

McClain Brothers Company

Signs

Standard Mfg. Company

Spike Disc

John H. Graham & Co., Inc.

Sod Cutters

J. Oliver Johnson, Inc.

Sprayers

Hardie Mfg. Company
Friend Mfg. Company

Sprinklers

L. R. Nelson Mfg. Company
Buckner Mfg. Company
Economy Irrigation Company
Campbell Irrigation Company
Double Rotary Sprinkler Co.
Perfection Sprinkler Co.

Spuds

Diamond-Calk Horseshoe Company

Stolons

O. M. Scott & Sons Co.
Lyman Carrier Products

Sulphate of Ammonia

Synthetic Nitrogen Products Corp.

Tee Markers

Standard Mfg. Company
G. B. Lewis Company

Tee Mowers

Toro Manufacturing Company
Pennsylvania Lawn Mower Works
Worthington Mower Co.
Ideal Power Lawn Mower Co.
Jacobsen Mfg. Company

Tee Stands

Worthington Mower Co.
G. B. Lewis Company

Tillage Implements

International Harvester Co. of America

Top Dressing

Hyper-Humus Company
The Ohio Humus Company
Atkins and Durbrow, Inc.

Tractors

E. G. Staude Mak-A-Tractor Co.
Toro Manufacturing Company
Worthington Mower Co.
International Harvester Co. of America
Ideal Power Lawn Mower Co.
Roseman Tractor Mower Co.
R. S. Horner

Tractor Wheels and Spuds

R. S. Horner

Turf Fertilizers

Armour Fertilizer Works

Underground Hose Locker

McClain Brothers Company

Urea

Synthetic Nitrogen Products Corp.

Wood Charcoal

Wood Charcoal Research Bureau

Worm Eradicators

Peter Henderson & Co.
C. B. Dolge Company
Reade Mfg. Company

EMPLOYMENT DEPARTMENT

Insertions of advertisements in this section will be inserted on receipt of copy and 50 cents in stamps.

GREENKEEPER WANTED

I have a position open for an all-around man, experienced in upkeep of an 18-hole sand green course. Must be A-1 with mowing equipment and machinery. Only one who takes interest in his work and sees that the job is done will be considered. Address all inquiries to Box 10, The National Greenkeeper and Turf Culture, Caxton Building, Cleveland, Ohio.

POSITIONS WANTED

Experienced greenkeeper with splendid references desires position in the Chicago district. Understands thoroughly soil and climatic conditions. Good man for any club. Address inquiries to Box A, The National Greenkeeper and Turf Culture, Caxton Bldg., Cleveland, Ohio.

Nationally-known greenkeeper with many years' experience in the construction and maintenance of several well-

known golf courses, such as Oakmont in Pittsburgh and Plum Hollow in Detroit. Has a son who will act as assistant and is an expert mechanic. This combination should appeal to any golf organization desiring efficient and economical management. The best of references will be furnished upon request. Address inquiries to Box B, The National Greenkeeper and Turf Culture, Caxton Bldg., Cleveland, Ohio.

Well-known greenkeeper with best of recommendations and thorough experience in maintenance and construction at low cost is open for position at prominent club at moderate salary. For full details address Box D, The National Greenkeeper and Turf Culture, Caxton Bldg., Cleveland, Ohio.

Pro-greenkeeper with many years' experience, seeks position as professional, pro-greenkeeper or greenkeeper. Grandnephew of the late "Old" Tom Morris of

St. Andrews, Scotland. References, John Ball, eight times British Amateur champion, and Jimmie Johnson, ex-American Amateur champion. Previous connections, Town and Country Club, Saint Paul; Midlothian C. C., Chicago; Louisville C. C.; Country Club of Harrisburg, Pa. Address Tom Morris, 1548 E. 64th Street, Chicago, Illinois.

Agronomist with several years' experience wants connection with golf maintenance work, consulting, managing or research. Thorough knowledge of chemistry, soils, fertilizers, grasses and how to buy the various things for golf courses.

New McClain Product

The always progressive McClain Bros. Company, 120 Second Street, Canton, who have developed so many splendid outfits for the maintenance of turf have just announced a new barrel pump and hydro-mixer which has many unusual features.

The makers claim that its low cost and simplicity make it practical for the care of turf everywhere. They also claim it saves enough time and labor to pay for itself the second or third time you use it and always does a better and even job of applying fertilizers and fungicides.

The process is to bolt the pump into a good barrel, put it on a truck, hook your hose to a hydrant and you will get 200 pounds pressure at the spray nozzle. This outfit, it is said, is unsurpassed for spraying shrubbery, shade and fruit trees, flowers, etc. It may be used either with three-quarter or one-inch hose and will empty a barrel in twelve minutes.

The makers claim that the hydro-mixer absolutely assures a thorough mixing and even distribution without streaking or burning; also that it is low in cost, simple and easy to operate, with perfect control at all times. It is especially recommended for applying sulphate of ammonia, soluble fertilizers, fungicides, vermicides and all products used for the maintenance of fine turf, plants and trees.

The makers will furnish complete directions regarding the use of this outfit. Those who are interested may write the makers at the address above.



will keep new-cut Greens free of ant hills and worms and not injure turf. Trial order to make fifty gallons.

\$7.00 delivered or buy it of your dealer

Satisfaction or Money Refunded

The Royal Products Co.

214-216 S. Charles Street
BALTIMORE - MARYLAND, U. S. A.

Dealers' Directory

A list of accredited dealers in turf culture supplies and equipment. Any one not listed is requested to send name and address and products they handle in the territory they represent.

P. L. BALDOCK
2240 Casitas Street
Pasadena, California

G. F. BISHOP COMPANY
1950 San Bruno
San Francisco, California

GORDON BUCKNER
Athens Athletic Club
Oakland, California

GEORGE A. DAVIS, INC.
5440 Northwest Highway
Chicago, Illinois

BOLSA SUPPLY COMPANY
330 Lake Street
Oak Park, Illinois

LUCAS BROTHERS
Palos Park, Illinois

J. OLIVER JOHNSON COMPANY
Morgan-Huron-Superior Streets
Chicago, Illinois

J. B. HURLOCK
517-21 S. Laflin Street
Chicago, Illinois

INDIANAPOLIS TORO COMPANY
221 W. Georgia Street
Indianapolis, Indiana

GLOBE MACHINERY & SUPPLY
Des Moines, Iowa

NEW ENGLAND TORO COMPANY
1121 Washington Street
West Newton, Massachusetts

LAWN EQUIPMENT CORP.
601 W. Larned Street
Detroit, Michigan

AMERICAN SEED COMPANY
Detroit, Michigan

GOLF & TRACTOR EQUIPMENT
CORP.
717 East Erie Blvd.
Syracuse, New York

EDWARD H. WORTHINGTON
405 Lexington Avenue
New York City, N. Y.

ARTHUR D. PETERSON
420 Lexington Avenue
New York City, N. Y.

TEMPLIN-BRADLEY COMPANY
5700 Detroit Avenue
Cleveland, Ohio

T. D. WOOD
3582 Winchell Road
Shaker Heights, Ohio

CLEVELAND TORO COMPANY
7620 Carnegie Avenue
Cleveland, Ohio

CHARLES M. INGERSOLL
1310 Linda Street
Rocky River, Ohio

J. W. LAWRENCE
3030 Euclid Avenue
Cleveland, Ohio

JAMES R. HOWELL
6715 Quinby Avenue
Cleveland, Ohio

H. H. MAJESKA
2114 Noble Road
East Cleveland, Ohio

WESTERN GOLF COURSE SUPPLY
COMPANY
284 E. 10th Street
Portland, Oregon

EDW. J. DARBY & SON, INC.
337 Brown Street
Philadelphia, Pennsylvania

PHILADELPHIA TORO COMPANY
1528-32 Belfield Avenue
Philadelphia, Pennsylvania

Domestic peat HUMUS

Pure organic material, ideal for soil improvement purposes. Complies with U. S. Gov't Specifications—available in finely fibrous or coarse form—Tell us your requirements. Shipment by bag, truck or carlot units.

Hyper-Humus Co. of Newton, N. J.
Main Office, Morris Bldg., Philadelphia, Pa.

**"The Readers of the NATIONAL GREENKEEPER are
Buyers and the Ones We Want to Reach"**

***The NATIONAL
GREENKEEPER
and TURF CULTURE***



LYMAN CARRIER PRODUCTS
GRANGER, INDIANA

The National Greenkeeper,
Caxton Building,
Cleveland, Ohio.

Att: R. E. Power

Dear Mr. Power:

The results we have received from
advertising in the National Greenkeeper are
showing nice returns.

As you know, our product Lecco,
the complete grass food, is sold on a very small
margin of profit and without the help of sales-
men. The National Greenkeeper and one other
journal carry all of our publicity.

In telling our story about Lecco
we have placed facts before your readers and not
theories or unproved statements and the response
has been very gratifying, not only from the golf
clubs but from cities, schools, cemeteries and
large private estates.

The readers of the National Green-
keeper are buyers and they are the ones we want
to reach.

Very truly yours,

Lyman Carrier

Lyman
Carrier's
LECCO

—The complete grass
food. Starve the
weeds and feed the
grass. Say goodbye
to the Compost Pile
and "Brown Patch."
The country's pre-
dominating fertilizer.

Lyman
Carrier's
COCOOS

The coming putting
green grass. The last
word in fine turf.
Just a little bit in ad-
vance of the times.
Place your order now
for 1933.

Lyman
Carrier's
WASHINGTON

strain of creeping
bent is a turf-form-
ing grass which
spreads by runners
which creep over the
ground. This is the
original Washington
strain.