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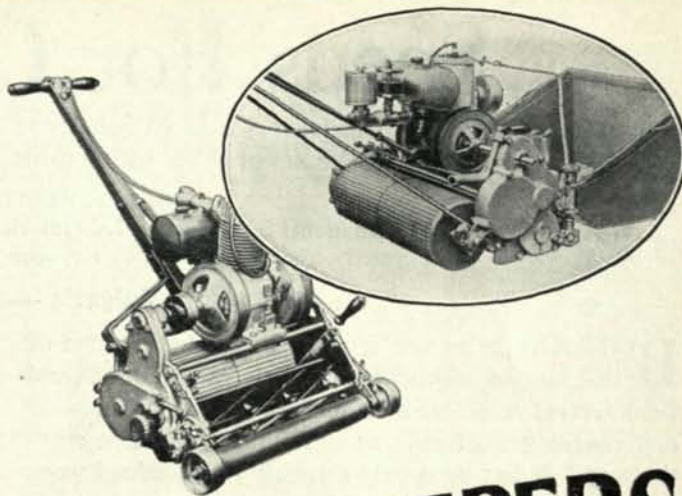
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# Seeds For Golf Courses

An expert's analysis of grass seeds which produce fine golf course turf. Origin and characteristics of the several varieties most generally sold by seed merchants

By E. E. PATTISON, Director

International Seed Testing Laboratories, No. 11 Park Place, New York City  
Formerly Seed Analyst U. S. Department of Agriculture, Washington, D. C.

## Agrostis Vulgaris —(Rhode Island Bent)

**B**OTANISTS do not agree as to the Latin name of that species which we commonly call Rhode Island Bent Grass; hence we have had some misunderstanding and confusion, not only as to the plant, but also as to the seed. It has been only through the combined work of Professors Hitchcock and Hillman that we now identify with certainty the plant as well as the seed.

This species is known by many different common names. To us in America it is Rhode Island Bent. To the people in New Zealand it is Brown-top or Colonial Bent, to those on Prince Edward Island, Canada, it is Fog, and to many Europeans it is Fiorin. Agriculturally, as well as commercially it ranks second to Redtop. Like the other species of *Agrostis* it thrives best on acid soil.

The principal seed producing areas are: South

seed is a mixture of several different species, yet it must be discussed here because at least 75% of the pure seed in all these mixtures is *Agrostis vulgaris*. The other Bents found in seed from South Germany are, Velvet Bent, Creeping Bent, and Carpet Bent. These species will be discussed in a later article.

The common commercial grade of South German Mixed Bent tests about 70% pure. The balance (30%) is usually harmless chaff. It has only been in late years that any attempt has been made to recondition it before leaving Germany. So now we have two other grades, one testing approximately 80% and the other (best grade) testing approximately 90%.

It is very easy to establish the origin of seed from this area, not only because it contains seeds of other bents, but because of the weed seed content. The origin of other bents is also determined in this way.

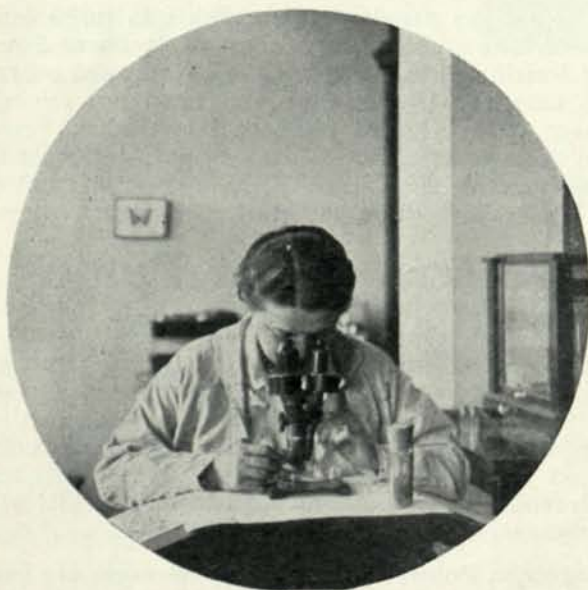
Bent of this origin is generally preferred to that of other origins, at least in the Eastern section of the United States, because it has a slightly finer leaf and is supposed to be more resistant to brownpatch. This seed is not quite as attractive in appearance as that from other sources.

## New Zealand Supplies Bent Seed

**T**HE next important source of supply is New Zealand. Most of the seed from this area is better cleaned than that from South Germany, and therefore, has a better appearance. There are lots that run as high as 98% pure seed, occasionally, however, it runs with a very heavy weed seed content. During the last year we have had some seed from this source that ran as high as five per cent mouse ear chickweed. Such seed even though 85% to 90% pure should not be used by any golf course. In a case of this kind buying on a technical purity and germination does not protect the club. It is better to have 70% pure with a weed content of less than 1% than to have 90% pure with a weed content of 5%.

There are no import restrictions or requirements for bent grasses, thus any kind of seed is permitted entry here. It is hoped that some day soon Congress will amend the Federal Seed Act so as to include the bents as well as the fescue and other fancy grasses.

The writer is told by many New Zealand exporters, that seed from the North Island is not adaptable to our conditions, and is a much coarser plant than that produced from seed from the South Island.



*The Author in Her Laboratory*

Germany, New Zealand, Prince Edward Island, Canada, Rhode Island (only a very small area), Oregon and Washington.

The wholesale price during the last ten years has fluctuated greatly. During this period it has sold as high as \$1.00 per pound, and as low as 35 cents per pound. At the present time it is selling at almost its low point.

## South German Mixed Bent

The principal source of supply is South Germany, and seed from this section is now sold under its correct common name of South German Mixed Bent. While this

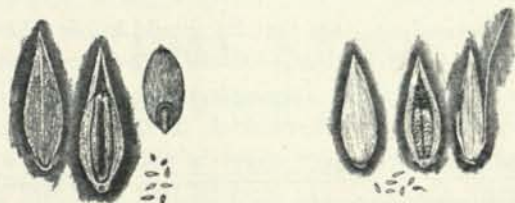
*Agrostis vulgaris* is not indigenous to New Zealand. It is supposed to have been introduced from Nova Scotia.

### Prince Edward Island Bent

WE come now to what in the opinion of some is the most interesting area in America. Prince Edward Island, Canada. It has only been in the last few years that seed was gathered here. *Agrostis vulgaris* is native to the Island. It is graded, cleaned and merchandised by a cooperative association known as the Prince Edward Island Seed Growers Association. The Association takes great care in accepting only seed from fields free of Redtop. It is reconditioned with care and so far as it is possible to ascertain, seed coming into this country from that source has always been of exceptionally high purity and low weed seed content.

### Rhode Island Not a Factor

JUDGING from its common name—Rhode Island Bent—one would suppose that Rhode Island was one of the principal producing territories. It is quite



*Agrostis Alba*  
(Redtop)

*Agrostis Vulgaris*  
(Rhode Island Bent)

*These drawings made by and published through the courtesy of Professor F. H. Hillman, Associate Botanist, U. S. Department of Agriculture*

the other way. Less seed is produced in Rhode Island than elsewhere. There are one or two growers there who still gather seed but the amount is so negligible that it plays no part in the commercial field.

### Oregon is Largest Producer in U. S.

OREGON is at present the chief seed producing area in the United States. This state also produces large quantities of Seaside Bent, and a variety of *Ag-*

*rostis vulgaris* known as *Agrostis vulgaris*, Var. *stolonifera*. Seed produced in this State and the neighboring State of Washington is exceptionally beautiful in appearance. It is entirely different than South German seed and more closely resembles Redtop in color and size. Some of this seed is brought around via the Canal to the Eastern Seaboard, but, as the demand for it on the West coast is good, and as the price is much higher than that of South German seed the majority of the seed crop stays in the West. It is not looked upon as being as hardy as South German seed and many say that the blade is coarser and the color not so desirable.

Most of the Oregon seed is produced around Coos Bay and Clatsop County, and the Washington seed in the Puget Sound district.

### How Bent and Red Top Differ

THE plant of *Agrostis vulgaris*, (Rhode Island Bent), can be distinguished from Redtop as the Culms are lower and more slender, panicle smaller, not contracted after flowering, ligule short and truncate. The seeds of *Agrostis vulgaris* can be distinguished from those of Redtop and other bents by skillful analysts, but the different characteristics are so delicate that no attempt will be made here to recite them in detail. The seed is generally smaller and duller than Redtop. The accompanying drawings illustrate this difference in size.

The principal use of Rhode Island Bent is for putting greens. Clubs that can afford it use it unmixed for their greens. Where a less expensive green is necessary, Rhode Island Bent should be mixed with Redtop, in the proportions of two pounds of Redtop to three pounds of Bent for every thousand square feet. During the last two years, the price of Rhode Island Bent (especially South German Mixed Bent) has been so reasonable that a great many clubs have been using up to twenty-five per cent in their fairway mixtures.

The next article will be devoted to Velvet and Seaside Bent.

## Wives of National Greenkeepers

THE secretary, Mrs. Willie Smith, wishes the members of the organization to know that Mrs. Varn Hagen, president, is now busily at work on their by-laws, and that each member will receive a copy within a very short time. In order to make this new organization a huge success, a drive must be made in each and every district for new members.

The Detroit district is very active we learn. Meetings are being held regularly at the different homes of the members and plans are constantly being made whereby their organization will become as strong as the National Association of Greenkeepers of America.

Any wives of greenkeepers belonging to the National association who, as yet, are not members will get all particulars by writing either the president or secretary. The secretary strongly urges members to keep in touch with one another, enabling them to know just what is going on at all times.

A very large membership is hoped for by convention time next year. Perhaps their membership will be close to that of the National, if every wife becomes a member. The men had better get busy on a new membership campaign or their record will soon be eclipsed.

# Midwest Greenkeepers Meet

By EDWARD B. DEARIE, Jr.

**D**EMONSTRATION Day of golf course equipment was the first topic of discussion at the monthly meeting of the Mid-West Greenkeeper's Association held April 4, at the Great Northern hotel, Chicago. The meeting was preceded by a very enjoyable dinner after which the minutes of the previous meeting were read and approved.

Fred Sherwood, Ed Laing and Alex Pirie, the committee appointed to make arrangements, recommended that the event be held during the second week in June at Sunset Valley Country Club, Highland Park.

Initiation dues of new members was then brought up by Alex Binnie and the meeting went on record in favor of them.

The Experimental Station in the Chicago District was reported upon by John MacGregor and Edward B. Dearie, Jr., its investigating committee. They asserted that Mr. G. M. Peters, chairman of the Chicago District Green Section, had told them early in the day that the preliminary arrangements for the enterprise were about settled and that it would be conducted by a committee of the U. S. G. A., C. D. Green Section and Mid-West Greenkeepers' Association.

## MacGregor on Board of Control

By vote of the meeting President John MacGregor was selected to represent the Mid-West Greenkeepers' Association on the board of control of the experimental station. It was decided that succeeding presidents of the organization should be likewise honored.

The meeting place for the next greenkeepers' convention of the U. S. Green Section was then debated. Members voiced the opinion that it should be held at Atlantic City because inland greenkeepers, attending the convention, would thus be given an opportunity to observe sea side courses. It was believed the delegates would find this fact of interest and the secretary was requested to advise the U. S. Green Section of the recommendation.

A suggestion by the Demonstration Day committee that all Green committee chairmen in the local district be invited to attend was approved as was also the suggestion that all equipment houses be requested to exhibit.



*John MacGregor  
Recently appointed a  
member of the Board of  
Control of the Mid-West  
Experimental Station*

Decision was made by vote to ask Mr. Joe Davis, secretary of the Chicago District Green Section, to notify the former.

The first outdoor meeting of the season, according to the decision reached, will be held at Beverly Country Club.

## Pirie Makes Stirring Speech

The speech of the evening was made by Alex Pirie of Old Elm Country Club who spoke about "The Future Greenkeeper." He gave some timely hints and expressed his opinion that the greenkeeper should be a man well educated in greenkeeping and well qualified to explain his actions and opinions to his chairman and board of directors. He added that the greenkeeper of the future should be enough of an executive to be able to handle a seventy-two hole course with the ease which characterizes greenkeeping on the present eighteen hole course. He emphasized the fact that he should know where the money goes which is charged to the golf course and why. He recommended the keeping of cost records, including those of labor and material, so that at the end of the year the greenkeeper might be able to make a comprehensive analysis. He asserted that no board of directors in the future would consider proposed changes in course operation without consulting with the greenkeeper.

The greenkeeper of the future, according to Mr. Pirie, should be a profound student of nature in order to pass judgment on any given subject pertaining to course maintenance. He must know solid types and be familiar with characteristics of grasses. In other words, he must know his turf.

Personality is an asset to be cultivated in the opinion of Mr. Pirie who asserted that the most successful greenkeepers are those whose cordiality invited members of the club to discuss subjects of interest.

Because of the responsibility attached to the position, the greenkeeper of the future must have first class qualifications backed by considerable experience and able to formulate and follow a workable plan for efficient and economical operation. Mr. Pirie added that the man who did not measure up to these strict requirements would soon "pass on."

"Greenkeeping has gone beyond the conception of the greenkeeper himself," concluded Mr. Pirie. "We are on the threshold of a new era of modern greenkeeping. The man of tomorrow must know greenkeeping in theory and practice in order to be rightly recognized as one of the future greenkeepers."

Appreciation of the address was voiced by members present who declared that it was one of the best of the season.

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*Greens and  
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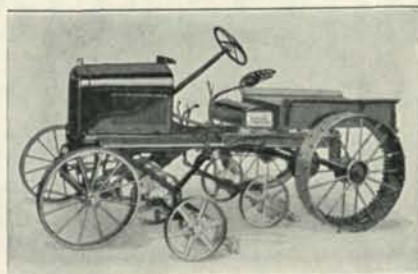
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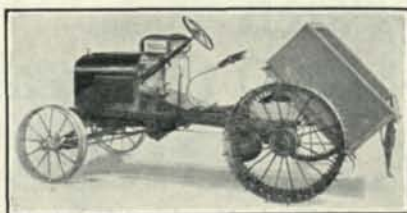
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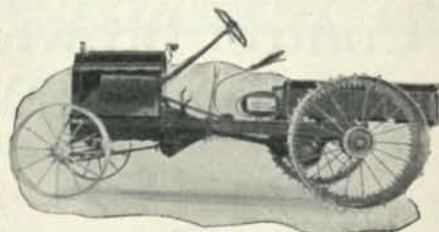
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# Flowers For the Clubhouse

Cleveland expert makes selection of suitable varieties of hardy plants and perennials. Flowers most important for clubhouse decoration. Greenkeeper can cut expense budget by growing them

By **BURT G. SHELDIN**, Greenkeeper  
The Country Club, Cleveland, Ohio

**I** DON'T know how many greenkeepers have to furnish flowers for the club house decorations, but I have been furnishing flowers ever since my connection with the Country Club, over 20 years ago. I grow only the flowers which can be cut for the table although there are many varieties with beautiful flowers which will not stand up good after cutting, or the stems are too short. First I shall give you a brief account of the hardy plants which I grow for the club.

**ROSES:** I have about five hundred roses of the hybrid type, most of them hardy which I do not have to give protection in winter, but the hybrid tea I give a mulching of straw or leaves. The rose is one of our very choice flowers and should be grown in every garden.

**AGUILEGIA OR COLUMBINE:** is one of the most beautiful spring flowers, stems being two feet or so above the foliage.

**PEONIES:** There are a good many varieties of these flowers and they are very useful as they come in bloom when there are not many other flowers in bloom.

**ACHILLEA: THE PEARL:** This plant is very useful, is two feet high and blooms during June and July.

**COREOPSIS:** A daisy like flower coming in bloom July and August.

**PYRETHIUM:** A small daisy like flower often called the painted daisy—July.

**DELPHINIUM:** There are several shades of blue, the spikes grow from three to five feet high.

**HELENIUM:** This plant sends up spikes from three to five feet tall, and when in bloom each spike will fill a vase. The colors are gold and copper.

**PHLOX:** There are a great many varieties of color, ranging from white to blue and purple, flowering in June and July.

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Save \$600-\$1000 this year by using

## CALOGREEN

(Special Finely Powdered Calomel)

or

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(Calomel-Corrosive Sublimate)

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3 ozs. per 1000 sq. ft. will give complete control.

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16 ozs. per 1000 sq. ft. to give complete control.

As the cost per pound of all these remedies is approximately the same, you can control large and small brown-patch at 1/5th your last year's bill—if you use the latest methods based on government experiments.

Write for free booklet describing these experiments, with directions for using CALOGREEN and CALO-CLOR.

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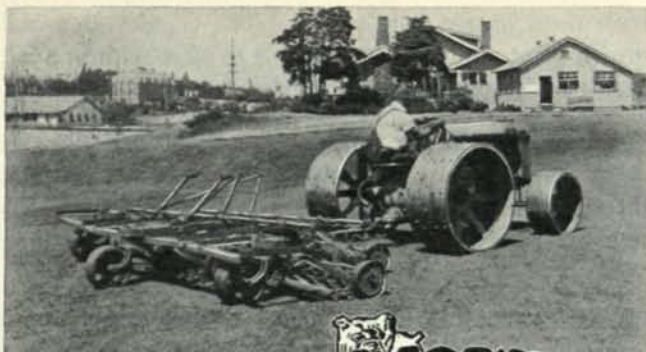
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# Golf Course Drainage

A series of articles written exclusively for The National Greenkeeper  
by America's foremost golf course drainage engineer

By WENDELL P. MILLER

## Part IV—Examining Land and Arranging Lines

**W**HILE the advice and services of a reliable engineer should be sought before planning the system and ordering the tile, the greenkeeper in the meantime may profitably examine the wet land he intends to drain, and keep a record of the extent of the area and the time required in drying out.

*Examine the Subsoil:* The nature of the subsoil determines the proper depth and distance between lines of tile. Use the soil auger or the ordinary posthole digger for testing the subsoil. On seepage marshes it may be possible in this way to discover the layer of sand or clay that is bringing in the damaging water. In any area it is desirable to know the depth of the top soil and the texture of both the top soil and subsoil.

*Always use a Level:* Even where a liberal fall is apparent, it is best to use a level to ascertain, approximately at least, how much that fall is. A carpenter's level set up on a box will indicate whether or not the apparent slope on the area is deceptive. If the preliminary observations with a carpenter's level indicate that the proposed line of tile cannot be laid to fall at the rate of 6 inches or more per hundred feet to a free outlet, then accurate leveling, preferably done by a skilled engineer with a surveyor's instrument, is the only safe course.

It is best to continue the levels a short distance below the proposed outlet to find out whether or not there is a danger of back water from below. The purpose of the main is to serve as an outlet for all of the low places tributary to it. For this reason, observations with a level are needed on all low places that may be drained into the proposed main eventually. Serious mistakes have been made putting in main drains too shallow to accommodate these low places.

Where some of the wet land tributary to a proposed main belongs to another land owner, co-operation is advisable. The extent to which this cooperation is necessary can be determined only after observations have been made with a level.

*Arrangement of lines:* The location of the main demands attention first; then location of laterals is made. Use a sub-main to carry the water from a group of laterals to the main where fall is gained, or where ex-

treme depths are avoided. It is better to have the laterals and sub-main discharge into a single main than to give each an independent outlet into an open ditch. *It is easier to protect one good outlet than several poor ones.*

On level ground where the fall is obtained by digging shallower at the head than at the outlet, a better fall is available in short lines than in a long line. However, for two rods or more before a lateral enters a main it passes through land drained by the main directly. This causes duplicate drainage and is wasteful. There is more duplicate drainage with a large number of short lines than with a smaller number of longer lines. Laterals making a sharp angle with the main they enter cause more duplicate drainage than when they join at right angles.

Generally laterals must be laid out in the line of greatest slope toward the main. The seepage at the foot of the upland is cut off by a line surrounding the ends of the laterals. For this line the liberal fall necessary is secured by starting it on the higher land and having it discharge into the head of a lateral on the low land.

Make straight lines where possible. Instead of bending a line so as to reach each of several springs, make the main line straight and put in a spur to tap each spring. To dry up a spring, get the tile where it will intercept the water before it appears at the spring.

*Distance between the Lines and Depth:* The number of lines of tile required depends upon the nature of the soil and the degree of drainage desired. Tile lines 30 feet apart in clay subsoils may not be as effective in removing standing water as lines 60 feet apart in sandy loam subsoils.

Certain general principles are found to govern the spacing and depths of lateral drains. These are particularly applicable to different parts of the system located in the same general area.

The flow of water through the soil to the drain is governed by the same laws which control the flow of water through the drain, or in a ditch along the road. The rate of flow in either case is dependent upon the fall or grade, the roughness of the sides of the channel and its size and shape.

The rate of runoff from the tile system is but the



*Editor's note: Mr. Miller was formerly Extension specialist in Agricultural Engineering at Ohio State University, and his background of training includes several years of study in soil physics and chemistry. Since 1920 his unusual abilities have been devoted to solving the drainage and soil improvement problems on golf courses*

# After testing the FAIRWAY WATER HOSE

for five months . . .

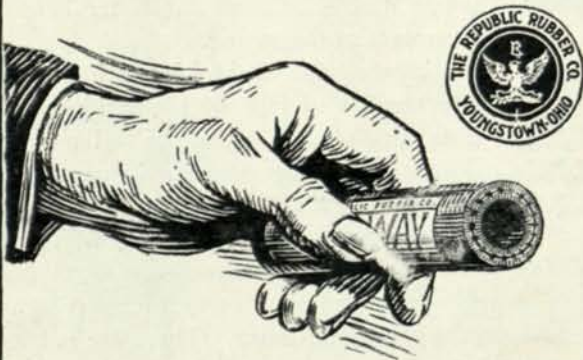
One large user of water hose ordered 2500 feet, saying it was the best he had ever seen and he expected to cut his hose requirements in half.

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rate at which the water moves through the soil to the drain, providing that the tile lines have a large enough capacity to care for all the water as it reaches them. It will be seen the watertable rises in a curve from each drain and reaches its highest point midway between two adjacent drains. Since for any field the size and shape of the soil pores, and the resistance to the passage of the water through them, are the same at any one time for different spacing and depths of laterals, it follows, that, in general, either decreasing the distance between laterals or placing them deeper will increase the slope from the crest of the watertable to the drain, so long as the crest of the watertable rises to the same elevation in respect to the surface of the ground. This will increase the rate at which water reaches the drain.

By increasing the depth of laterals, and accordingly lowering the groundwater line after each rain, a larger column of soil is freed from surplus moisture. As it is only in that portion of the soil which is free from surplus moisture that plant roots can obtain food and live, it becomes one of the important functions of under-drainage to maintain the groundwater line at each such level as will best serve vegetation.

Any change in the system by which the groundwater can reach the underdrains more rapidly will hasten the drying of the soil after rains and permit of earlier cultivation.

The effects of spacings and depths of laterals may be summarized as follows:

Decreasing the distance between drains not only increases the rate of runoff but decreases the time necessary to remove the surplus moisture after each rain.

*Increasing the depth of the drains increases the rate at which the drains remove water from the ground and lowers the average level of the groundwater, thus providing a larger food supply for growing turf. In considering different spacing and depths it should be remembered that the rate of movement of water through a close, fine-grained clay soil is always less than that through the more open loam. This point should be considered when contemplating any increase of depth which will place the laterals in a more impervious soil. The increased depth might thus be a detriment for the first few years. It is doubtful, however, if there are any soils in the Central States in which the lateral drains should not be placed as deep as recommended hereinafter.*

Thus it is seen that the success of any underdrainage system depends upon the freedom with which water may pass through the soil. Many persons hold the erroneous belief that the water falling on an underdrained area moves directly from the surface to the top of the drain. Such is not the case. No water ordinarily enters a drain from the top except that which falls upon the surface directly above the tile, and then only when the soil conditions are such as to allow of an early vertical percolation from the surface to the underdrain. The surplus