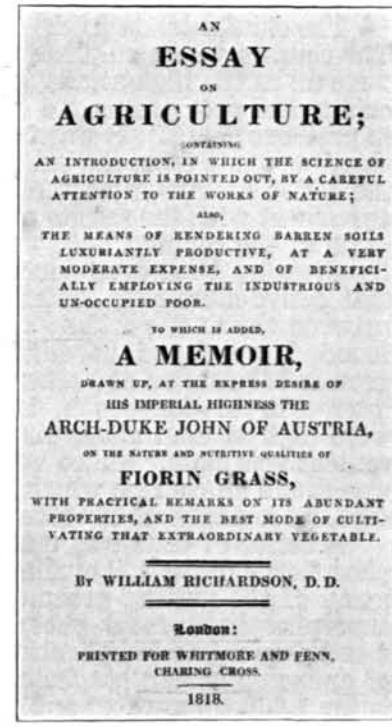
Cultivating Creeping Bent a Hundred Years Ago

By John Monteith, Jr.

Since the bent grasses, seeded or planted with stolons, have become so universally used on putting greens in the United States they have been the subject for almost endless discussion as to their merits or failures as well as to the best methods for their culture. After reading or listening to the dissertations on bent grasses so frequent today it is amusing to turn back over a hundred years and find a creeping bent enthusiast propounding to the world the virtues of his favorite grass and telling of his discoveries—which are so often rediscovered in modern times. All bent enthusiasts would, no doubt, be interested in reading the book of 173 pages written by Dr. William Richardson and published in 1818, the title-page of which is here reproduced. The book is, however, not readily available to our readers; quotations from it will therefore be presented here, and rather freely.



AN

ESSAY

ON

AGRICULTURE;

CONTAINING

AN INTRODUCTION, IN WHICH THE SCIENCE OF AGRICULTURE IS POINTED OUT, BY A CAREFUL ATTENTION TO THE WORKS OF NATURE;

ALSO,

THE MEANS OF RENDERING BARREN SOILS LUXURIANTLY PRODUCTIVE, AT A VERY MODERATE EXPENSE, AND OF BENEFICIALLY EMPLOYING THE INDUSTRIOUS AND UN-OCCUPIED POOR.

TO WHICH IS ADDED,

A MEMOIR,

DRAWN UP, AT THE EXPRESS DESIRE OF

HIS IMPERIAL HIGHNESS THE

ARCH-DUKE JOHN OF AUSTRIA,

ON THE NATURE AND NUTRITIVE QUALITIES OF

FIORIN GRASS,

WITH PRACTICAL REMARKS ON ITS ABUNDANT PROPERTIES, AND THE BEST MODE OF CULTIVATING THAT EXTRAORDINARY VEGETABLE.

By WILLIAM RICHARDSON, D.D.

London:

PRINTED FOR WHITMORE AND FENN, CHARING CROSS.

1818.

The question naturally arises as to just why we print such ancient writings. It is partly because of historical interest for those with such likings, partly because the simple advice contained in the volume is not unlike the most up-to-date advice available on the subject today, and partly because many of the discoveries made by Dr. Richardson over a century ago have not yet been "discovered" on many golf courses where attempts are now being made to grow creeping bent.

Dr. Richardson's degree of D.D. indicates that he was not an agriculturist by profession; but he apparently became so interested in his hobby that he came to be regarded as an international authority on the subject of grasslands. He was interested in the development of agriculture as a means for bettering conditions in his native land of Ireland, and felt that one of the most promising fields for development was that of better pasturage, especially by the use of creeping bent, or "fiorin" as it is called in Ireland. Although by no means the first, Dr. Richardson certainly was one of the earliest of that group of humanity commonly designated as "turf nuts." He saw in "fiorin" an opportunity to convert tremendous areas of unproductive land into profitable meadows, and felt that the development of these wastes would largely solve the pressing national problem of his generation, namely of "employing the industrious and unoccupied poor." Needless to say, in his day putting green problems were unheard of, but if he had lived in this present generation he undoubtedly would have enthused over creeping bent, not as a

relief for the great mass of poor but rather for that wretched multitude constantly struggling against par.

RICHARDSON'S DISCUSSION OF THE PROBLEM FROM THE STANDPOINT OF AGRICULTURE

Dr. Richardson studied and wrote about creeping bent from the standpoint of the farmer raising it for hay. In reading his lines one can substitute "greenkeeper" or "green committee" where "farmers" are referred to, and "golf turf" for "meadows," and his writings will have surprising application today. In the first part of his book he discusses the need for new information on agricultural subjects. Much of the needed improvement which he foresaw has been realized in the many agricultural colleges and experiment stations throughout the world; but such developments in turf studies are yet in their infancy, so his suggestions are still almost as pertinent as when written. Introducing his subject he writes:

"This earliest, and most necessary of all sciences, ought, as I think, to be considered as consisting of three separate departments, distinct from each other; the THEORETICAL—the EXPERIMENTAL—and the PRACTICAL.

"The *First*, and *Second*, are at present quite absorbed by the Third, without any prospect of emerging in their proper and distinct characters."

He then discusses the separate field and the desirable characteristics of each of the three separate "departments." The theoretical department he calls upon to furnish the new ideas based on a general knowledge of natural forces. These ideas are then submitted to the experimentalist for trial.

"The EXPERIMENTALIST should be careful, patient, and diligent, without prejudices, or even opinions on the subjects before him; he is to make his experiments on the very smallest scale, so that he can diversify them without expence, and without having any interest in their success:—failure is to him exactly the same thing, as information is his sole object."

"The *third* character in the drama is the PRACTICAL AGRICULTURIST, of whom I complain that he has taken upon himself the whole three characters I mentioned: he treats the theorist with supercilious contempt, as presuming to obtrude his wild speculations into a department of which he considers himself as complete master.

"Hence improvements are discouraged, and discoveries that might have proved useful, are nipped in the bud.

"The *second* character I wish to introduce, does not yet exist; whence it comes, that discoveries which have been forced into attention, rarely meet with a fair trial; they are encountered by the *practical farmer* with prejudice, and even with jealousy. They are considered as obtrusions; and treated as uninvited, unwelcome strangers.

"Sometimes, indeed, the practical farmer pursuades himself, that he has assumed the character of the *experimentalist*, and tells us he has made the experiment;—that is, he has cultivated a field in a particular way: but it is not from solitary trials on a great scale, that information is to be obtained; experiments lead us to knowledge by *comparison;* they should be multiplied and diversified.

"Hence agriculture, *as a science*, is at a stand:—the present possessor of the field, perfectly satisfied with his own attainments, and in high admiration of his own practices, (often very good) does not admit improvement to be necessary, and indignantly rejects any innovation.

"He is encouraged in his contempt for theoretical speculations by the ridicule which a witty author throws on the agricultural *projectors* of his day."

He adds:

"I have shewn that the writers, both agricultural and botanical, of the seventeenth century, had taken such notice of the *agrostis stolonifera*, as might have induced their successors to form good expectations from it, or at least to pay it

some attention; but I was quite mistaken, for nothing similar followed. These latter gentry seem to be as little acquainted with the writings of their predecessors, as with Nature herself, and to have taken no pains to improve their acquaintance with her, either by actual experiment, or further observations on this grass."

He then expresses his opinions on agricultural "book-makers," whom he blames for blocking the progress of scientific agriculture. He points out that—

"Their object was to detail to the world what they *saw* and *knew;* they were not looking for *new* discoveries: in short, they were not *experimentalists*, and it is by a succession of patient experiments alone, that the properties of *new*, or *any* vegetables, can be found out and established."

Needless to say, it requires no stretching of the imagination to recognize in the above some of our modern writers who profess to be aiding greenkeeping but who in reality are using the ancient methods of obstructing progress.

It will interest many readers to know that even the earliest creeping bent enthusiast met with much criticism; but to his critics he replies:

"I have long ceased to notice the silly cavils against the culture of *fiorin*, so often brought forward by hostile and prejudiced ignorance."

He further observes:

"The incredulity of man is a more formidable obstacle to improvement, than any resistance thrown in our way by Nature."

Complaining of the lack of attention to turf problems, he writes:

"We have Sir Humphrey Davy's high authority for the wretched progress this important branch of agriculture has made."

Concerning this complaint it is interesting to turn to the criticism made by Dr. C. V. Piper over a century later. In 1924 Dr. Piper wrote: "The weakest place in our knowledge of forage production in American agriculture is unquestionably that relating to pasture and pasturage. * * * The better management and improvement of pastures is perhaps the most crying need of American agriculture." It is therefore apparent that Dr. Richardson's appeal failed to receive attention; and this lack of fundamental scientific information on turf for pasture explains the lack of understanding of problems on golf course turf.

Turf Diseases Suggested

It is of further interest to read his comments on plant diseases, especially since his remarks were largely in the nature of prophecy, for diseases in both animals and plants were then little understood. Many of the grass fans of today, in spite of the more advanced information available to them, can profit from Dr. Richardson's observations. He writes as follows:

"It is in adversity, when the vegetables he is cultivating are attacked by various disorders, that the agriculturist will find the benefit of the arrangement I have suggested, as it will enable him to meet with strength, and I may say, discipline, the difficulties he will have to encounter.

"That the vegetables we cultivate should be subject to disorders, is to be expected; since it appears, that not a single one of them is a native of the climate to which we have introduced them, all transplanted from regions more favoured by nature, habituated to a warmer, and generally a drier atmosphere.

"Thus then as the strangers we have transferred to our ungenial climate, have acquired disorders from which they were probably exempt in their own milder regions, it becomes the duty of the *naturalist*, that is, according to my

arrangement, the *theorist*, to investigate the causes of these disorders, and to exert his ingenuity in devising remedies, to which the *experimentalist* is to give a fair trial on a small scale.

"Many of these disorders, I apprehend, will be found to arise from *parasitic plants* attaching themselves to the one we foster, and intercepting its nourishment; others, I know, will be found to proceed from myriads of *microscopic animals* invading our plant, and forming their nidus in the most delicate and important parts of its structure; destroying its germ, or consuming and spoiling its farina."

His "parasitic plants" and "microscopic animals" may well be interpreted as the various fungi and bacteria which since his time have been found to cause diseases of plants.

Early Experiments With Creeping Bent

Concerning his early interest in grass ("gramina") production Dr. Richardson writes:

"In my early agricultural pursuits, I soon discovered that the *gramina* was a subject, on which the practical farmer, and his instructors the modern agricultural writers, all *seedsmen, nurserymen, and agricultural book-makers*, mostly from GRUB-STREET, were equally ignorant."

Referring to his first trials with creeping bent he states:

"I was now most sanguine in the pursuit of this new grass, and on November 15, 1806, after potatoes, laid down a rood with it, in the following way;—I raised fiorin roots in abundance, from my plots which had luxuriated greatly in the summer. I planted them in drills eighteen inches asunder, trusting that the *stolones*, with whose properties I was now acquainted, would, in the summer, shoot across the intervals, and clothe the whole surface.

"I was right; in May the stolones began to project across, and so effectually to cover the new ground, that the rows were soon no longer distinguishable; the thick fleece was uniform, and obviously a most valuable crop."

His early experience proved so encouraging that he experimented with the grass under widely different conditions and made extensive observations over a period of years. He found under some conditions—

"* * * that in the practice of years, the plant abated gradually of the luxuriance it first exhibited under them, shewing, after some time, that they were not to be persisted in with prudence."

Nevertheless his experience led him to write:

"I boldly say, that my conviction of the value of this grass has never been on the wane, and that from MAY 1806, when I first began to make observations upon it, until this moment, my expectations of the benefits to be derived from the discovery of fiorin, have been increasing, and my hopes at the end of every successive year more sanguine;—for, though I was obliged to give up some uses and applications, that I had previously recommended, others were perpetually occurring, that more than compensated for them; these variations being the consequence of the diversified, and I may almost say, contradictory habits of this strange vegetable."

"That its crops can be raised and kept up in continued luxuriance, on the same good grounds, on cheaper terms, and with greater certainty, than those of any other grass, I persist in asserting, having my *tenth* and *eleventh* successive crops *now* making up, without a trace of diminution in their value."

Referring to the wide range of adaptability of this grass, he writes:

"Fiorin, as I have often proved by respectable testimony, confirmed by my own ten years' experience, luxuriates equally at the *top of the mountain* and *bottom of the valley*.—Not so the rivals it has to contend with in lower regions."

Dr. Richardson soon learned the need for drainage. In spite of the fact that this need has been recognized for over a hundred years, how often do we find modern growers trying to maintain a stand of bent on putting greens where drainage problems are completely overlooked! He writes:

"The soil in which it delights most, is *loose, dry*, and of some *depth*, whether peaty or loamy."

Later he explains:

"I say the soil should be *dry;* this is indispensably necessary: but I prefer a soil *made dry* by many surface drains, to one naturally so; for a soil kept wet, by a retentive bottom refusing a passage downwards to the deluges of rain, is clothed mostly with the grasses that affect such soil, and some fiorin among them. Change the nature of the soil, from *wet* to *dry*, from *poor* to *rich*, and the paltry ungrateful aquatic occupants pine and vanish; while the fiorin, now in its favourite soil, comes forward in luxuriance, and takes possession."

In another place he writes:

"Though this grass preserves its existence, and even its health, under such opposite extremes, it luxuriates into value only under more favorable circumstances, for the soil in which it grows must be tolerably deep, and well drained, so as effectually to prevent any water stagnating about its roots."

He cites several instances where the grass had been submerged for long periods without apparent injury. In one case—

"I found, that after seven months' submersion, the emerging verdant sole was pure fiorin: a hard gravelly bottom precluded the aquatics; and other grasses would have been drowned."

Again he writes:

"I have had fiorin stolones sent to me from its [Chester Dee] muddy and sandy banks *below* high-water mark, for this strange grass agrees equally with fresh and salt water."

In spite of the apparent contradiction, he recognized that good drainage was essential to improve wet meadows for creeping bent. Concerning the improving of such land he writes:

"The only operation we have to perform on the area chosen, is to relieve it effectually from all under water, and to enrich the surface by good top-dressings.

"The former point we carry by frequent open drains, parallel to each other; their distance governed by the nature of the ground; if the subsoil be retentive, they should be the more frequent and deeper, not less than fifteen inches, and in the form of an *equilateral* or perhaps a *right-angled* triangle, that they may not be easily choaked up; and also that they may be readily cleared when necessary: the stuff raised in the formation of these drains is to be thrown into tall heaps, their distance from each other governed by the power of the labourer in pitching."

As an example of results obtained from such treatments he refers to—

"* * * a rich fiorin meadow, so low that its surface *never* rose more than twelve inches above the level of the perpetually stagnant water: no other crop that I am acquainted with could have been advantageously pursued on such low ground; yet my seventh crop is now promising well upon it."

He fully recognized the difference in response of creeping bent and what we know as Rhode Island bent on low, poorly drained land. Referring to this difference in behavior he writes:

"The vicinity of the water would, I am confident, prevent the obtrusion of the *agrostis vulgaris*, while it would not injure our amphibious *stolonifera*."

"DEEP ALLUVIAL BOTTOM occasionally submerged, would be far more productive in this way than in any other. I should hope that upon such grounds

the *agrostis vulgaris* would not obtrude, and occasional submersions would not injure my crop, *standing or cut*. Very frequent drains indeed will be required to let off the water *rapidly*, and to keep it as far distant as we can from the surface and roots of the grass."

He recognized, as many golf course men have recently learned, that wherever creeping bent occurred it could be made to take possession of the area, provided it were properly encouraged, without the aid of any seed, roots, or stolons. For such improvement he advocated surface drainage, top-dressing, and feeding, together with weeding. Open ditches were used rather than the tile drainage system of golf courses. The material taken from these open ditches was used for top-dressing. He says:

"For top-dressings, our resources are most abundant; the heaps I mention are upon the spot, and when improved, only require to be thrown by the shovel on the contiguous surface.

"Our sources for this improvement are *two, lime* and *ashes*."

In another place he states:

"Any manure suits it, and it agrees particularly well with *ashes* and *lime*, pure, and still better if mixed up in compost."

The ashes were produced on the ground, for the territory of which he wrote was well supplied with peat, which was piled up and burned to supply the ashes. That of course was before the days of commercial fertilizer. Concerning the cost he writes:

"We know that *ashes* alone, at threepence per cart, will give, pure or in compost, a good stimulating top-dressing on very reasonable terms."

He apparently recognized the influence of lime, especially in encouraging clover, for in one place he writes:

"I am unwilling entirely to give up *lime*, it is so encouraging to the kindly grasses, and particularly to the smallest of the clover tribe, known to be most grateful to all cattle; and the certainty of such herbage instantly following lime, is well known by the experiment perpetually made, of scattering some lime on a *peaty mountain*, to show that the place will immediately be covered with white clover."

When conditions were made favorable for bent he realized it was still necessary to help it by removing the worst weeds.

"Fiorin luxuriance, though very late in commencing, continues much longer in vigour than that of any other vegetable I know; so long, that its stolones form a thick mat on the surface, under which no other vegetable can exist:—thus, while coarser rivals are pointed out for *man* to extirpate, the fiorin itself suffocates, and exterminates the more diminutive ones, and remains in exclusive possession of the field.

"Still, however, that possession must be watchfully guarded, and the destruction of intruders never intermitted."

We might even read his lines to indicate that he was the first advocate of acid soil for bent, since he recognized that certain soils favorable to bent were less favorable to some weeds. He writes:

"In *cold, sour, low lands*, we have a better chance of succeeding, because the change we most operate on the soil, will be injurious to the rivals in possession, and we may be able to weed out new intruders."

Dr. Richardson records many other observations which are so often repeated in modern writings. For instance, he records the long life of stolons after they are cut and dried. He also recognized different types of creeping bent, although he did not isolate separate strains. He learned that irrigation improved the grass, but found

that too much water was harmful in the end, and he therefore abandoned irrigation.

CREEPING BENT FOR THE NINETEENTH HOLE

Dr. Richardson apparently saw possibilities in creeping bent which even our modern enthusiasts have overlooked or, possibly, keep to their own counsel.

"My friend the HON. GEORGE KNOX, our first chemist, undertook to find the comparative quantities of *saccharum*, in fiorin, and common hay: I furnished him with the former, and he procured some of the best common hay in the market.

"I called at the laboratory of the Dublin Society, where Mr. Knox carried on his operations. When he reduced the residue from the two hays to a consistence like tar, that from fiorin was like rich molasses, while the other residuum was a nauseous and bitter extract.

"Mr. Knox's brother, the BISHOP OF DERRY, encouraged by this, attempted to distill spirits from a decoction of fiorin hay, and completely succeeded.

"I now applied to the Revenue Board for a licence to set up a small temporary still, and made the experiment *eight* several times, and always succeeded. Many respectable persons called to witness the process. * * * All saw the still run, and tasted the spirits."

CREEPING BENT FOR THE METROPOLITAN DISTRICT

Many golfers wonder to whom belongs the credit or blame, as choice may designate it, for introducing creeping bent into this country. In this connection it is interesting to read Dr. Richardson's own words:

"Since I commenced this Memoir I am called upon to a new and very promising field, *the marshy* (and I presume alluvial) grounds bounding the great American rivers.

"Mr. SWARTSWOUTH of NEW YORK, encouraged, as he tells me, by the successful experiments of JUDGE PETERS and others on European fiorin grass, is most anxious to have my opinion on the probability of its succeeding on the marshy banks of the NORTH RIVER, so as to enable him to supply the city of NEW YORK with hay.

"I had formerly declined to encourage the gentlemen of BOSTON to cultivate this grass; for finding I had been unable to persuade my *English* pupils to keep the fiorin I was teaching them to cultivate free from weeds, I feared I should also fail in NEW ENGLAND, where the rush of summer vegetation was so much more powerful.

"I have given more encouragement to Mr. SWARTSWOUTH, and have transmitted to him full directions. * * *"

"DIRECTIONS FOR LAYING DOWN AND CULTIVATING FIORIN"

"In the first place, I wish the soil to be *deep*; for although fiorin roots penetrate but a little way below the surface, yet it is of very great importance, that the loose and well-tilled soil should reach much lower.

"The ground should be already *dry*, or *made* dry, by many open surface drains; for if water, whether atmospheric or other, be allowed to collect and stagnate about the roots of the grass, it soon becomes acrid, and highly injurious: this rule is *indispensable;* yet occasional floodings, or even long submersions, do not seem in the least to injure this grass, if rapidly let off.

"Fiorin must have the exclusive possession of the surface, that is, all intruders, especially other grasses, must be carefully weeded out, whenever they appear. I may add, the surface must be frequently *top-dressed;* and these renovations will abundantly repay the trouble and expence they occasion.

"In laying down fiorin crops, we neither use *seed* nor *roots*, when we can procure *stolones*, of which every cultivator has a superabundance; and the mode of proceeding is very simple.

"We commence at one end of the prepared area, and scatter stolones, at their full length, over a space extending along the fence, and about three yards wide.

I can not determine how thick they are to be spread; we know that nearly every joint will strike a root, and we must take care to secure roots enough.

"We now from the raw ground behind us take up shovelfulls of the loose surface soil, and scatter it over the stolones, so as *nearly* to cover them, and thus the business is done for so far: we then take up another breadth of three yards, spread strings over it, and cover them in the same manner.

"Where we have tender rich compost, ready prepared, it is more desirable to drop loads, or barrowfulls of this, through the field, and to cover the stolones from these, rather than from the plain surface.

"It is thus I have clothed all my own meadows with fiorin, and I know not any *annual* crop laid down so cheaply; for the stolones cost us nothing, and it is not a crop for one year only, as I have now my tenth and eleventh crop in full luxuriance; and the sole of grass never seemed to require any style of renovation save top-dressing.

"*Weeding*, indeed, must be repeated, as often as intruders appear; and I do not find the labour lessens with the age of the meadow—but my contractor seems to think he has a good bargain, at five shillings per English acre."

Where stolons are scarce the farmer "must use them more sparingly, and scatter the stolones thinly, or plant the roots at a greater distance; and to throw them into higher luxuriance, he must be liberal of his dung, or compost, which he can probably well afford, as, in the case I put, his area will be small.

"I would also in this case adopt the style I used in laying down my first crop; for by stretching them *in drills*, we economize the stolones: the early weeding by the *iron rake* will be very effectual, and the well-defined narrow drills will be easily weeded by hand."

"I have often been asked what is the best season for laying down fiorin. Here, as in many other parts of his business, the farmer has not always an option; he must do several things when *he can*, though it be not the most desirable time: to determine that, we must speculate a little, *à priori*, and consider what difficulties our favourite has to encounter in its progress, that we may contrive to avoid them; none from seasons, for this hardy grass vegetates at all seasons; the roots equally, and the stolones tolerably; at the worst, that is, in the middle of winter, the only difficulty to be dreaded is the rush of intruding weeds and grasses.

"The best possible season must therefore be that, when this HOST of enemies is able to do the least mischief, which I find is from the 8th of September to the 25th; for in this interval the efforts of vegetation are strong, and both fiorin and its rivals come forward vigorously; but the latter is soon destroyed by the winter frosts, to which the fiorin is quite insensible, and remains torpid, or rather languid, until it is with all other vegetables roused by the genial spring, and in its vigorous progress finds no rivals to encounter but those which are just beginning to vegetate—of course *diminutive* and *weak*.

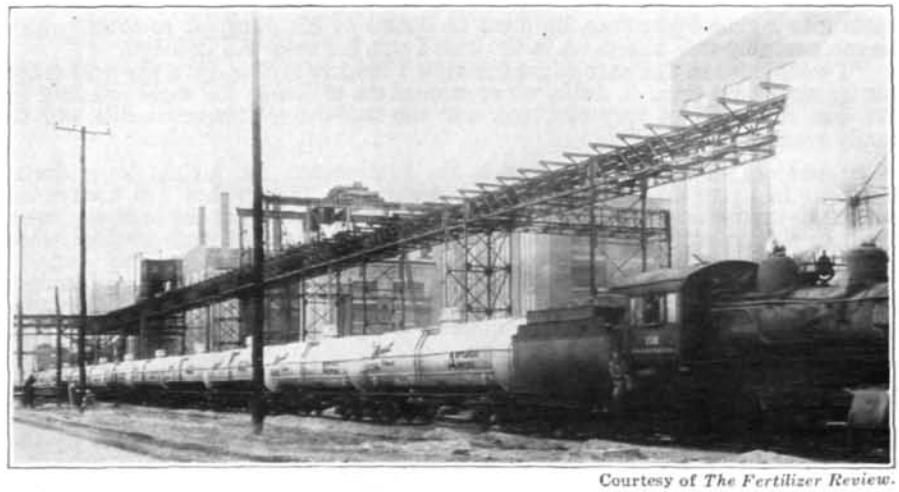
"Had we commenced earlier, the intruders would have time to acquire strength enough to sustain the frost, and the contest between them and the fiorin would have been carried on on equal terms."

"If we lay down in spring, we have the enemy to encounter in full vigour, and in this case I advise laying down in drills, that we may have the assistance of *the rake* in exterminating the weeds."

Approximately 257,000 short tons of cottonseed meal, or slightly more than 12 per cent of the crushings, from the 1927 cotton crop, were used as fertilizer. Of the 257,000 tons, about 170,000 tons were used directly on land and 87,000 tons by manufacturers in the production of commercial fertilizers.

Nature abhors straight lines, uniformity, and regularity. Golf was originally played on land unaltered by the hand of man. To regain the original charm of the game a golf course should abound in curves, variations, and simple irregularities.

Southern limit of bent grass and fescue.—One of the rather puzzling phenomena connected with all temperate perennial plants is that every one of them has a fairly definite southern limit. Thus timothy can not be grown successfully farther south than about the northern limit of cotton. Apples are grown a little farther south than timothy, while both the pear and the peach succeed considerably farther toward the equator. The southern limit of bent grass and red fescue is about that of timothy. Curiously enough, in the drier half of the United States all these plants succeed farther southward than they do in the eastern part of the country. It is not, however, safe to assume that because bent and fescue are good in southern California they will do well also in Florida. Theoretical explanations of the phenomena involve temperature, humidity, and length of day, and are somewhat technical.



Courtesy of *The Fertilizer Review.*

A Shipment of Synthetic Nitrogen

This train of tank cars, loaded with anhydrous or pure ammonia, is ready for shipment at the new nitrate plant of the Atmospheric Nitrogen Corporation, at Hopewell, Va.

The plant began commercial production of synthetic nitrogen in the fall of 1928 and is now operating on a production program which is greater than the maximum of 40,000 tons a year expected under most favorable circumstances at Muscle Shoals. The anhydrous ammonia is shipped in specially constructed tank cars to fertilizer factories, where it is used in making complete fertilizers. Since it is pure ammonia it is transported at relatively low cost. It is reported that 25 fertilizer companies are now using anhydrous ammonia in 70 plants. Some of it no doubt will reach greens and fairways during the coming season.

Soggy spots apparent in the turf in early spring are prime indications of inadequate drainage.

Haste makes waste. It is much cheaper and more satisfactory to extend construction or reconstruction work over two or three years than to waste money and pave the way to subsequent alterations in an effort to do it all in one season. It is on record that after a certain golf course was built and played on for a while it was decided to reverse the direction of play throughout. Another new course was soon reconstructed with the holes laid off at right angles to their original directions.