



NEWS LETTER

*The secret of happiness is not in doing what one likes,
but in liking what one has to do.*

—JAMES M. BARRIE.

MAY

1935

This NEWSLETTER is published monthly by the Greenkeepers Club of New England, and sent free to its members and their Greens' Chairmen. Subscription price ten cents a copy, or a dollar a year.

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May, 1935

Vol. 7, No. 5

It was six years ago this month that we issued the first NEWSLETTER, so this issue starts the seventh year. We hope that we have improved not only in size, but also in helpfulness and interest.

From all reports, nearly all clubs experienced considerable Winter injury to the turf in their greens, in some cases nearly the whole green being killed. As was the case a year ago, the velvets are reported to have suffered the least. The clubs with ample turf nurseries are again proving the wisdom of their foresight in having the sod ready for this emergency.

A cool Spring seems to have prevented rapid repairs to damaged turf. Growth has been slow, and even sufficient rainfall has been made insufficient by drying winds. All has not been ideal, but we may still remember that it might have been worse!

The April meeting of the Rhode Island Greenkeepers' Association was held at the Goddard Park Golf Course on April 29th. The May meeting will be held in conjunction with the annual Greenkeepers' Field Day at the Rhode Island State College on May 27th. Here is an opportunity for all interested in turf to put in a day to advantage, to examine the best turf plots in New England and to hear what is being done here and there in turf work.

Word has been received from Prof. Lawrence S. Dickinson of the Mass. State College that the annual Lawn Day, held each year during Farmers' Week, will present an innovation in its program this year. Scheduled for July 23rd, the program will have an arrangement of demonstrations of cultural facts supplemented with talks. The purpose of these demonstrations will be

to present fundamental things in turf culture. Attendance at this day's program by greenkeepers and green chairmen would result in a keener appreciation of the many problems in turf culture.

How many members have you helped this Spring with advice on turf problems? The number of home lawns which are better due to advice of greenkeepers would run into the thousands. Do your members appreciate all this advice which they are getting? Do they realize that this advice comes because of their membership in the club?

What poor maintenance practices are you using which will cause you trouble later? What obsolete equipment are you using that is running up your labor cost? What practices are still demanded by your members that increase the costs beyond reason?

It is not economy to slip up in preparing compost or in care of the turf nursery.

The matter of a club library is being deliberated by a committee, of which Howard Farrant is chairman. He would be pleased to get any ideas on this matter from any of our members. The idea as first presented was a thought to be of more service to our members by enabling them to borrow books and bulletins on turf from a central club library.

It was six years ago that the Green Section Bulletin reported good results from using lime, after a period of sulphate of ammonia. Where have we gone in the last six years? It strikes us that most of us are now using a little common sense and not overdoing either the sulphate of ammonia or the lime; but, we still have problems. The very existence of the Green Section is threatened by the fact that the U. S. G. A. has too few member clubs. To whom are we to look to solve our problems as they arise? We still ask for a definite program by all existant research agencies, and hope that the future will present more funds in all directions for organized research.

Are you keeping records of all that you do on your course this year?

It is encouraging to note that most club officials are friends of the greenkeepers.

PUBLIC FEE COURSES BENEFIT GOLF

by H. C. Darling, Jumper Hill Golf
Course, Northboro, Mass.
(from Recreation Conference)

Before attempting to point out some of the benefits to golf from the public fee courses it seems necessary and advisable to remind you of certain facts you already know in order to give you a clearer picture of this subject.

Of the total number of golf courses in the country numbering altogether some 5,700, there are three different groups divided as follows: 4,457 private clubs, 543 municipal courses, and 700 daily fee courses. These figures are taken from Golfdoms survey published in June 1932. Up to the present time, the only material change which may have taken place in these statistics is an increase in the municipal courses as a result of the C. W. A. funds made available by the Federal Government.

This audience should be reminded that each one of these three groups of golf courses was originated and established with slightly different intentions and purposes in serving the public.

Primarily, private golf courses are established by a group of people for the purpose of forming a club of more or less selective nature to enjoy their social and recreational activities within the group. Like most clubs it is not developed for the purpose of making money but strictly for social reasons.

The object of the Municipal courses is to offer the inhabitants of the cities a recreational playground. Such courses are not intended to be social clubs nor a profit making enterprise but merely a recreational center where the folks from the thickly populated section can find a wide open space for their diversion. It is financed and operated by the cities.

Daily fee courses differ entirely from the former groups in that their purpose is for profit as well as pleasure. It is a business enterprise like any manufacturing establishment or store. It is usually financed and operated by an individual or a small group of people.

In this audience I assume, there are greenkeepers representing every one of these three mentioned groups. Probably there isn't a greenskeeper here who holds any ill feeling toward a fellow worker in one of the other groups of

courses. But perhaps there is some antipathy on the part of the management of one group toward those in the other groups particularly, when they tread on one another's toes. For this reason I think it is well to point out the original purposes of these groups as I have already done and also go on to show the need and the demand for each of the groups in the different communities. Perhaps if we all can better understand the reason and the need for the other fellow being a neighbor rather than a competitor and all try to establish our rates on the basis for which each group is intended we will all have a better feeling and perhaps a better financial record.

Now that I have mentioned rates I might as well express my thoughts at this point and present them for what they are worth. During these depressing times when all three groups have lost some of their regular players it is quite natural to blame the other groups for enticing the players away with lower rates. We are likely to overlook the fact that whether in good times or bad the difference in rates between the groups will always be quite distinct due to the nature of the organization and the class of people being served.

The daily fee course becomes envious of the swarms of customers at the nearby municipal course and attempts to compete in price. The private club begins to look with envy on the numbers at the daily fee course and proceeds to abandon initiation fees, reduce membership and transient rates. What is the result? Some players may be attracted from the other group but actually very few, and certainly not enough to justify the reduction in income.

It is absurd for any daily fee course to attempt to compete with a municipal course. The latter is a non-profit organization, has no taxes to pay and seldom charges complete costs against the golf department. If there are any losses they are charged to the tax payer.

The cost differences between the private club and the fee course is almost as great as in the case just mentioned. The expensive club houses and the demands of members in the private club for the most part are so much greater than the fee course player it makes an overhead charge that prohibits any competition with the fee course.

Why try to do the impossible, and why not stay within the group to

which you belong. There are enough competitive troubles within the group.

Now let's consider the service that these three groups are performing in the golf world. Of the 2,225,000 golf players in the United States over half of the number play at public courses. 58% at municipal courses and 42% at daily fee courses.

If there were no public courses the chances are that most of these million and a quarter golf players would be out of the golf picture entirely. This large army of recreational seekers would be interested in most any other sport but golf. Their statement would be "golf is for the wealthy and the elite".

This is one of the things that public courses have done for the golf world. It is a parallel case to what Henry Ford has done for the automobile industry. It has put golf into the hands of the wage earner because of price.

Municipal courses can offer more inducement to the wage earner to play the game because it is operated more or less on a cost basis. The cities have financed the construction of very fine golf courses thru-out the country usually near the center of population where it is possible to reach the courses either by street car, bus, or on foot. This cheap, wholesome exercise for the individual has gone a long way in increasing the large number of golfers. Municipal courses because of their accessibility and low rates every year are attracting and developing golf players out of thousands and thousands of school children who otherwise might have no interest in the game. We all have noticed the change which has taken place in the sand lots and back yards. We find that golf clubs are fast replacing baseball bats. Isn't this the reason for the great increase in the number of fine young amateur golfers we have noticed in recent years. Think of the prospects this group of players alone offers to the golf world: to the daily fee courses and the private clubs to say nothing of the future for the manufacturing end of the industry.

Now let's consider the personal side of the great mass of people we find at the municipal courses. There are all races and types made up from the working class, and it is quite natural because of the great crowds found at these courses on the busier days that golf etiquette and thoughts for the other fellow are

sometimes lacking. These things are obnoxious to a certain class of people and this group turns to the courses farther away from the city where it is less crowded and where there is less hurry and bustle.

This brings us to the daily fee courses. A place where the person of moderate means with not enough income to permit playing at a private club can enjoy the game to his satisfaction. The fee courses are the stamping ground for the following type of players.

1. The family whose income has been reduced to a point where it is either a case of giving up golf or playing where it is cheaper than the private club. Incidentally, as a consolation to the private clubs it should be remembered that the fee courses are keeping this group interested in the game during the depression and many or most of this class will return to the clubs when normal incomes return. It is possible that if they gave up golf temporarily and became interested in other forms of recreation in some cases they might never return to the game.

2. Another class of people with a fair income may dislike the club and social atmosphere or possibly the cliques and difference in social standing which may exist at the private clubs. They want golf and nothing else. The fee course fills the bill for this class.

3. Next there is a group with a desire for the social and the club surroundings but whose income never has, or perhaps never will enable them to join a private club. In their minds a municipal course is too common so they select a fee course where they can strut.

4. Another very large group at the fee course is the golf beginner. The type who is reluctant to face the crowds at the munes and who does not feel qualified to play on a private course. The number of this group is a real problem to most fee courses. They know nothing about golf etiquette, they tie up the course for others and can they dig the turf and tear up the traps.

To give you an example: On one occasion last year my attention was called to a beginner playing our first hole which is 283 yards, the last hundred being a rather abrupt slope. Even if I couldn't have seen this man it would have been possible to have tracked

him to the green. Every twenty yards there were the largest and deepest divots I have ever witnessed and not one piece replaced. Without exaggeration those divot holes were nine inches long and 2 to 3 inches deep. I caught him before he reached the green and needless to say he was referred to the pro.

This man was intelligent and apparently held a good job but was absolutely ignorant of what the game was like. Power was his idea for success.

But we cannot get away from the fact that with all the trouble this group causes, their money is as good as the next fellows and they must be served in some way. With the right attention they may become our best customers in a short time or they may be playing on some private course a few years hence.

In other words the fee courses might be called the prep school for the private clubs. So many times we have nursed along a beginner until he or she plays a fair game and then they graduate to higher learning. I mention this for the benefit of the greenskeepers from the private clubs because I know for a fact that we have schooled a great many for your clubs. This is one of the benefits of the fee courses to you men.

To go into further detail regarding the benefits from fee courses, it is well to again remind you that such courses are operating a business. And like any business to be successful it must be profitable, it must render a definite service, it must have satisfied customers and it must keep its name before the public. As far as I know the fee courses are the only ones in the field who are advertising golf to the public. A lot more advertising should be done by these courses, perhaps more along educational lines.

Advertising has already done a great deal toward enticing new golfers. It has broken down the resistance that golf is an old man's game, is only for the rich, or the aristocrats. This gradual enlightenment as to what the game is all about through advertising has not only made new golfers but has made thousands of prospects for the game at private clubs, as well as public courses.

This advertising job which has been done, has been carried on for the most part by the aggressive free courses. There are many courses as in any business which have spent nothing in aggressive advertising and salesmanship.

The alert and up and coming fee courses are after the factory and office groups and are making it interesting for such groups to play in a body through company tournaments, four ball teams, and golf leagues. This rivalry and keen interest being created naturally encourages new golfers all the time. Through this activity men are being pulled away from baseball, and other sports to enlarge the golf field of recreation.

Naturally this not only increases the business of those courses sponsoring these things but makes a lot of prospects for the municipals and the private clubs. I point out this thought because I think many times the management of the munies and the private clubs without giving it much thought have condemned the fee courses as being unnecessary and having no place in the golf picture.

To get back to the beginners which I previously referred to as a problem at the fee courses, we find it is necessary and I know others have too, to do a certain amount of educational work for our good. We feel that the sooner these new players can learn golf etiquette, golf rules and the proper way to conduct

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themselves on the golf course, the sooner will our difficulties end. At our course in addition to offering group golf lessons for the beginners we have attempted a golf school particularly for the lady beginners where they are shown in a group all the primary points of conduct on the course, such as how to handle the flag, on the green, where to lay the golf bag, how to act at the tees, what to do when players are anxious to play through etc.

Of course, this takes time and is an extra cost but it seems to be an appreciated service and makes for more congenial players on our course. Incidentally, we emphasize to our customers the importance of good conduct on the course and when someone violates this even in a mild way, we do not hesitate to have a frank but diplomatic talk with such persons to explain the better feeling and the better comradeship that will exist throughout if every one strives to make the course one where the game can be enjoyed to its fullest extent. (Do you think you could get away with it at a private club?)

Having already referred to price cutting, advertising and education on the fee courses, may I get off the subject somewhat to talk directly to any fee course greenskeepers and managers who may be present. What I have reference to is a daily fee golf association, here in Massachusetts and particularly in East-ern Mass.

At the present moment there is no organization whatever of the daily fee courses in this state. In the eastern part of the state we did hold one meeting last fall with this object in view. The enthusiasm and desire for an organized group was quite apparent at that time and everything seemed to be all set to go ahead. The plans we made for the second meeting depended upon the action of one man who we thought was the key man to lead us on. Unfortunately, this man was tied up in Washington on a job which made it impossible for him to help us in any way. It was then too late to accomplish much because the courses had closed for the season.

I regret that we didn't organize last fall because I think we will see a greater need for unity on the price question this spring than ever before. I strongly recommend therefore that we organize just as soon as it is possible.

The first serious question we have to deal with this spring whether organized or not is price cutting. During these depressing times it is very easy to allow the imagination to work up to the point where we decide that to get business we must cut the price.

Surely we do not wish to go through the same war that the fee courses experienced in Chicago during 1932. None of us wish to see 25 cent golf and none of us wish to see our friends pushed out of business through murderous prices. When we start slashing prices we give the public a terrible weapon to use against us. Someone comes to us with the statement that so-and-so has cut the price. We get panicky and without investigating we get into the vicious circle and the fireworks start. Possibly we increase our course attendance temporarily but in the meantime our income has been reduced and we have one terrible time getting back to normal rates again.

It is my suggestion therefore that before believing any report on a cut rate, make a thorough investigation and get the facts. A great many times it will be found that the player misunderstood or got the information second hand although he will swear he got it straight.

This matter alone is important enough to deserve an immediate organization to work out ethical methods of doing business and stabilization of prices and rates.

More than this an organized group of courses can accomplish a great deal in general advertising and education. We have not yet scratched the surface on the development of new players. A few courses cannot begin to make the same progress that is possible through united effort.

Another need for organization is along the lines of favorable legislation to protect the fee courses from unfair and unreasonable competition from an over abundance of tax free municipal and state courses. We don't object the increase in courses nor do we say much about the low rates charged to the residents of the cities but we do object to the low rates charged to non-residents. We think it is unfair competition.

Still another need for combined effort was shown last fall and still is being shown at the present time and this is in relation to the legalized racing menace

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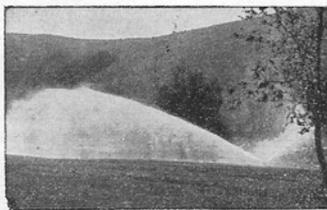
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that threatens every golf course in this state whether it be a private club, daily fee course or municipal course.

In closing may I make a few remarks on this subject directed to every man in this room whose job depends upon the success of golf.

Last November we were all asleep before this question was brought to the polls. We permitted the racing interests to advertize and sell the public on what a splendid thing this was without even a murmur, when down in our hearts we all knew what it would do to us, and to the poor suckers who went to the races.

I still think that 95% of the votes cast were in entire ignorance of what it was all about. About the only thing the public knew about was the two million dollars or more that was paid to New Hampshire and Rhode Island by the race tracks and they figured in some way it would come back to them.

Ordinarily I would hesitate to condemn or fight openly any competition which is fair and of benefit to the public but I make no bones about fighting this threat to our business. If it attracted only the rich who could afford to lose, it would be another story but this business entices the poor even more than it does the rich. 95% of the betters are sure to lose, but they go to the races in greater numbers in times of depression because they hope and pray they can make a few dollars to pay their mountainous debts. They usually come away from the races poorer than ever and then the butcher, the baker, the grocer and the landlord have still longer to wait for their money.

How does it affect the golf business? Private clubs as well as fee courses in the vicinity of the Narragansett track can tell you some discouraging tales of what it did to them. At Attleboro where our friends the Wendell Brothers operate a course, they stated that during the racing season on a Saturday 16 people was a good attendance and sometimes it dropped to far less than this.

What are you as greenskeepers going to do about it or what can you do about it? First I would say that every greenskeeper here should go back to their managers and if they are not already aware of this menace this race business has to golf, give them an earfull. Next suggest that they get the golfers behind a move to stop the letting of any space to a race track whether it be dogs or horses within their district.

The next move is to get the store keepers on the warpath by pointing out the disaster to them if they do not already know.

I think it is a duty of the greenskeepers for the good of their own courses to go into action on this thing. Although we have already let this thing slide too long, it is still possible to keep this menace from our own doors.

MAY MEETING

The May meeting was held on the 6th at the Nashua Country Club, Nashua, N. H. An eighteen hole medal handicap tournament produced the following winners:

- 1st gross, James McCormack, 83.
- 1st net, Lloyd Stott, 97-64.
- 2nd net, Albon Wendell, 92-65.
- 3rd net, Howard Farrant, 90-66.

Plan to attend the Greenkeeper-Club Official meeting at Wachusett on June 3rd, and the Greenkeeper-Pro Best Ball Championship at Brae Burn on July 22.

The object of the P. G. A. is to uplift and promote the game of golf. The golf clubs need the club spirit.

Lewis Myers.

Golf clubs should consider becoming community clubs, with varied activities to attract other members. Modern merchandising methods should be used by club officials.

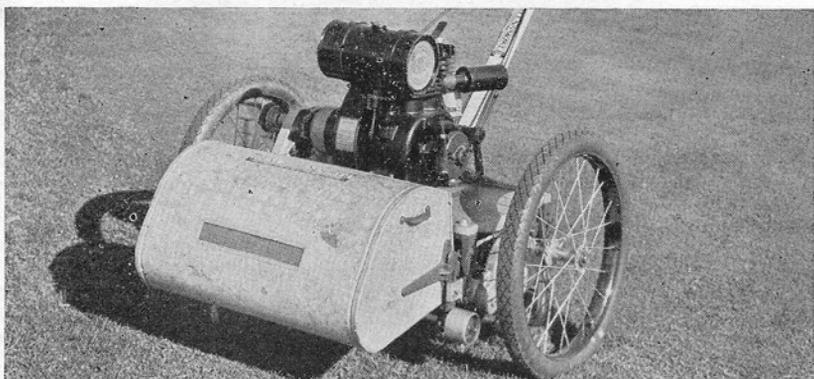
Charles E. Mason.

Club employees, who have given their clubs long and faithful service, should be given as great a sense of security as possible, and above all should not be discharged for any fancied grievance or because of a mere change in committee chairmen. No employee can give his best to his club, nor conduct his work efficiently if he is in fear of losing his position without just cause.

Guy C. West.



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DETERIORATION PROBLEMS IN NEW ZEALAND CHEWINGS FESCUE

N. R. Foy, Seed Analyst, Plant Station,
Palmerston North.

(A SYNOPSIS)

DETERIORATION in the germination capacity of Chewings fescue seed during shipment from New Zealand to northern countries has for many years been a constantly recurring trouble, yet, in spite of this fact, the annual export totals have remained reasonably steady.

American buyers appear to have accepted Chewings fescue as a characteristically delicate and short-lived seed, and, although periodically complaints have followed unsatisfactory deliveries, particularly in unfavourable production seasons, the demand has been well sustained. Naturally, with the continuance of a retail demand, the importers meet it, and as far as the American retail market is concerned no serious complaint appears to have been made. Presumably Chewings fescue is regarded as low-germinating species, and therefore a high-germination capacity is not expected.

Until the advent in Great Britain of green-keeping research, the same remarks might well apply to the British trade, but investigation into the relative values of various fine-leaved turf grasses has disclosed the fact that although Chewings fescue is a desirable turf constituent much of the seed retailed is of a very inferior quality and, by virtue of this fact, of little value in sports-turf establishment.

It has been made quite plain that if Chewings fescue can be landed in Great Britain with a sufficiently high vitality to permit of its retaining a reasonable high-germination capacity up to the time of retail sales—say, six months—then the prospects of an extension of the present trade are most encouraging. On the other hand, it is equally clear that if the trade continues on the present lines those in a position to do so will not be prepared to recommend unconditionally the use of the seed, and this will be obviously to the detriment of the industry in New Zealand. The fact that the various forms of European fescues are at present under investigation in England, although not necessarily with the one idea of replacing New Zealand seed,

will tend to create an independent attitude on the part of British consumers.

The attitude of the consumer section of the American trade is not so clearly defined; one assumes that the retail trade is satisfied with present conditions, but it is very probable that if the quality of the seed moving on to the retail markets was of a known higher standard the American demand would be improved. Dissatisfaction with deliveries of New Zealand seed was no doubt responsible for several attempts to grow Chewings fescue in several States, and, although these attempts were not attended by any great success, they are not without significance.

Prior to 1925 many theories as to the cause of deterioration of grass-seed during shipment were put forward both in New Zealand and abroad. Most of these were investigated. It was concluded that, contrary to general opinion, deterioration was due to unfavourable shipment conditions to which Chewings fescue and crested dogstail were peculiarly susceptible, that the unfavourable conditions were associated with high degrees of temperature and humidity. Furthermore, it was recognized that the degree of deterioration was controlled to some degree by seed-vitality, which in turn is influenced to a marked degree by a number of factors operating during production, the chief of which were seed maturity at harvesting, maintenance of soil-fertility to a standard of fescue requirement, and the renewal of worn-out pastures.

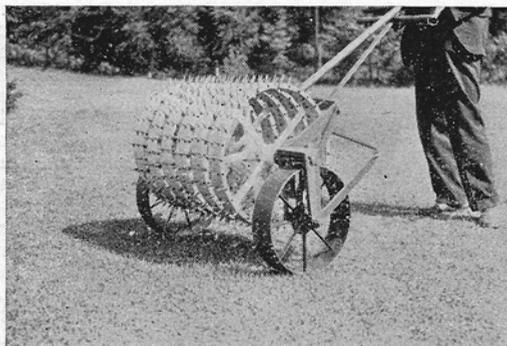
So far as the production of fescue is concerned, in the light of further experience, in the opinion of the writer, these views still hold good. Well-matured seed harvested from vigorous healthy stands invariably ships and stores well under average conditions, and in normal production years by its superior quality, is distinguishable when shipped with other lines under identical conditions.

The fact that the germination capacity on arrival of several lines shipped on the same steamer is not always consistently high or consistently low has led to the suggestion that the cause or causes must be associated entirely with production, for the reason that were transit conditions responsible all lines would deteriorate to an equal degree. An acceptable theory for this inconsistency has already been given, and of far greater significance is the fact that invariably there are wide dis-

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crepancies between the germination capacities of exported seed and of portions of the same lines retained under normal storage in New Zealand. Such discrepancies naturally can be accounted for only by deterioration during shipment and, as suggested previously, are undoubtedly due to excess of heat and/or humidity obtaining in the ship's hold. The effect of these conditions on most short-lived seeds is known to every seedsman, who, wherever possible, provides dry, well-ventilated space for bulk storage. The conditions under which seed is shipped from one hemisphere to the other are, in most cases, the antithesis of shore conditions—hold temperatures particularly in the tropics are known to be much above normal and the relative humidity of the air surrounding the seed following temperature increases must be unduly high. Unfortunately, no reliable data concerning the temperature and relative humidity of ships' holds are available, but from various observations it is known that both conditions are almost invariably excessive.

The high relative humidity of the storage atmosphere is due partly to the release of water vapour from the seed itself, and is partly, in some instances, provided by associated cargo. At all events, sufficient moisture is carried by the seed to exercise harmful effect when temperatures are increased. All seeds naturally contain a certain amount of moisture, the amount varying with the type of seed. Grass-seeds have, in most species, attached glumes, and a proportion of the moisture content is held by the glumes. Therefore the percentage moisture content of a sample of seed such as Chewings fescue is actually disproportionately high and is more readily released than is the moisture held by the grain. It is probably the glume moisture which is responsible for the rapid changes in the relative humidity of the storage air under the influence of temperature changes.

The general overseas opinion appears to be that the prevention of transit losses lies in improvement in production methods. To a limited extent this is true, as repeated reference in this article to seed-vitality will testify. The production of seed of the highest possible vitality is most essential, and to this end nothing but thoroughly mature seed saved from healthy, vigorous stands should be saved and offered for the export trade. Seasonal conditions will at times tend to nullify growers' efforts in this respect,

but seed of heavy weight and high quality must in all seasons be the growers' ideal.

It has been stated previously, however, that the production of high-quality seed may be regarded as only a partial remedy, and an insecure one at best. It is therefore very clear that as transit conditions are responsible for deterioration that either these conditions must be altered or that seed be prepared to withstand conditions unfavourable to it.

It has been shown that associated conditions of high temperature and high humidity are directly responsible for transit losses, and that provided one of these conditions is reduced below normal the other may rise to abnormal levels without causing harm. Two alternatives then present themselves, either cool storage or the reduction of humidity by artificial drying of the seed itself, both of which possess merits and demerits.

Cool storage has already been put into operation in 1933. Unfortunately, purely from the experimental point of view, the high quality 1933 seed in many instances carried almost equally as well in hold storage as in cool storage. Nevertheless, the differences in germination capacities of seed shipped under either one of the two methods were significantly in favor of cool storage. There are, however, attendant disadvantages, the chief of which perhaps is the difficulty in securing suitable space on conveniently sailing steamers. The trade is not sufficiently large to warrant the provision of special accommodation for seed, and shipments have to be adjusted to suit what is offering. Secondly, normal deterioration appears to continue during the period of cool storage—admittedly at a slightly slower rate—and is also not in any way prevented during storage after delivery—an important point.

Artificial drying prior to shipment has not yet been attempted commercially with Chewings fescue, the opinions expressed in this article regarding its efficacy being based entirely on information gained from experimental drying on small-scale shipments made in co-operation with two overseas seed-testing stations—the Official Seed Testing Station for England and Wales at Cambridge, England, and the Division of Seed Investigations, Department of Agriculture, Washington, D. C., United States of America.

It will be concluded that seed-drying offers the most satisfactory means of overcoming transit deterioration and

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seed so treated will retain vitality for at least six months after delivery. Perfectly dry seed will store for a very long period; there is at the moment under test at this Station a sample of ten-year-old Chewings fescue seed which shows a growth of 75 per cent. This has been stored in a desiccator over calcium chloride and for seven years germinated over 90 per cent. The undried portion of the sample had completely lost vitality in two years and a half.

Seed-drying as carried out in various parts of the world, principally with grain, consists in the removal of excess moisture and is known as "conditioning". The grain is then stored at or near its normal moisture content. The drying of fescue, however, consists of the removal of approximately half the normal moisture content, and obviously if the seed is stored under average atmospheric conditions moisture will be taken up until the normal level is attained. It is this fact which is responsible for the difficulties which attend to the shipping of dried seed. It is not sufficient that the seed be dried, but that it be kept dry for the period of shipment and storage. Dried seed in ordinary sacks shipped only to a slight extent more satisfactorily than undried, so that under these circumstances drying alone is not economically sound. The question, therefore, centers on suitable moisture-proof containers, which would conveniently be in the form of sack linings. A number of proprietary sack linings were imported, but none were found to be sufficiently proofed to prevent the ingress of moisture. It is considered, however, that as these types of linings are designed for the storage of normally dry products—that is, as a protection against excessive moisture—the manufacturers possibly would consider the preparation of special linings for seed. The writer is at present in communication with certain firms with this end in view. There are other types of containers in which seed might be stored, but sack storage offers many advantages, the chief of which is economy and convenience. Probably the only disadvantage is the possibility of the too free use of hooks during handling in and out of store, rail, and ship.

In North America and in Europe there are in use a number of grain-dryers which mostly utilize heated air as the drying agent and which could be adopted for the drying of grass-seed. The rapidity of the removal of moisture

depends, of course not only on the temperature but also on the volume of air which can be passed preferably, through layers of seed. The air may be heated by means of steam coils, electrically heated coils, coke, coal, or oil furnaces.

Nothing can be said here as to the cost of artificial drying, which must necessarily add to the export price of the seed. Presumably, however, seed of a guaranteed germination capacity would be sold at a premium. Furthermore, there are the losses in weight occasioned by the removal of a portion of the contained water, which, when the seed is in the undried state, costs money. Therefore a minimum amount of moisture would be removed, say, 5 per cent to 6 per cent.

The available information in respect of cool storage is not extensive, but it is evident that it offers possibilities. Artificial drying with special packing as a safeguard against deterioration during transit and storage is definitely superior, but should this method prove uneconomic or for any other reason inoperative, then cool storage provides a second line of defense. It would seem that there are possibilities in its employment for early shipments of seed intended for early sowing. It is intended to institute experiments designed to elucidate this point and also ones in regard to the most suitable storage temperatures.

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"Inexperience is easier to train than bad experience".

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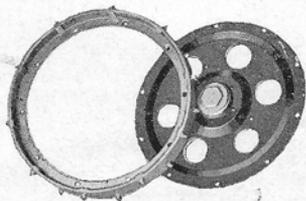
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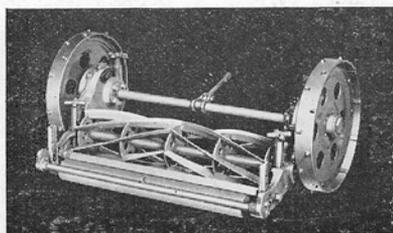


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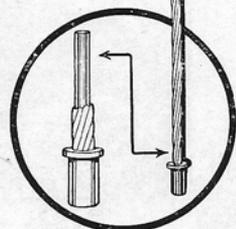


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