

Fall Seeding Factors That Chart Successful Policy

By PROF. LAWRENCE S. DICKINSON

VERY few practical turf growers believe spring seeding of turf better than fall seeding. In fact the advantages in favor of fall seeding are so great, it seems strange that there are so many major-sized turf areas sown in the spring. Park, estate, and cemetery superintendents, however, are more frequently found with spring seeded turf than are the greenkeepers.

Unfortunately many greenkeepers have such unlimited faith in fall seeding that they consider it lightly and go about it carelessly, the result being a waste of time, money, and material, and what is worse, having discouraging results or experiences.

Fall seeding is not free from facts or factors that require thoughtful consideration. These factors must be considered separately and in many combinations. It is the purpose of this article to consider a number of the factors that contribute toward success or failure with fall seeding and at the same time to avoid, if possible, an expression of a seeding policy.

Difficult to Get Policy

The reasons for avoiding an expression of a seeding policy are several. One, the greenkeeper is better fitted to make the decisions as they affect his particular problem. Certainly such is the case if he realizes the most important factors that control the results. Two, seldom does one find entirely similar conditions at two or more different golf courses. Third, available funds, playing wishes of clubs, and what is extremely important, the ability of the greenkeeper to sort out facts from any article that apply to his course, his budget, and his experience, and discard the rest, are all different. With the above reasons for avoiding the definite statement of a fall seeding policy as a basis to work on, it is quite obvious that the remainder of this article, if it is to be of value, must be a series of more or less disconnected paragraphs, each dealing with a basic fact or cultural principle.

From these basic facts and cultural principles the reader can formulate a program to help in the solution of his particular problem. When formulating the policy to be adopted, bear in mind (here green-committeemen should take particular notice) that to obtain *one* desired result it may be necessary to go directly opposite several sound cultural principles. In fact the greenkeeper is constantly borrowing from "Peter to pay Paul" or choosing weekly sacrifices from his stock of good cultural experiences to offer upon the altar of the god of low scores.

Before discussing the factors that enter into fall seeding, a brief review of its advantages and criticisms should be considered, as compared with spring seeding.

Fall seeded grass plants have less weed competition in their youth. Young grass that has grown in the fall is present and growing in the spring before weeds think of germinating.

Better Root Systems

There is much evidence to show that fall sown grasses have better root systems than those sown in the spring.

There is less danger from loss by sun scald or dampening off if the seed is fall sown.

Fall rains may be long and cold, but seldom are they like the spring downpours that wash away earth, young plants and seed.

There are many other well known arguments in favor of fall seeding, and several equally well known in favor of the spring-time for sowing seed. There are three more or less hidden dangers to be avoided when seeding in the fall. One is unknown or untried drainage. Too many fairways and putting greens have been seriously damaged because the "drainage ought to be good" or it was not thought about. Another is the frost heaving of the young grass plants in the spring. This is not very serious as the universal practice of spring rolling usually corrects this difficulty. The third is the exaggerated me-

chanical injury that can occur to young turf during the winter months if there is little or no snow. Trespassing upon young grass during the winter months should constitute a crime punishable by no less a penalty than the ducking stool. This applies to trespassers on the snow over the grass as well as upon the grass itself.

Fall Seeding Facts

A late growing season will cause the young grass to grow tall, developing long leaves. With the leaf growth a normal root development may be expected. Result! More carbohydrates manufactured and root space for their storage, thus assuring a vigorous plant in the spring.

Too long grass mats, particularly under snow, furnishes an excellent culture medium for a fungus such as snow mould, which is very likely to be fatal to young grass.

The grass under mats does not start as early as shorter grass in the spring, causing a very uneven turf.

A growth of tall young grass invites clipping. Close clipping of young grass plants is very often fatal, as it removes all the leaf, leaving only a stem, and there is not sufficient root developed to grow new leaves.

Top clipping of young grass tends to cause it to stool more quickly than if untopped. Stooling is desirable as it gives a thick, strong turf.

Large stools on a putting green make a "bumpy" surface and bald crowns that require extra top-dressing.

Kentucky bluegrass seedlings prefer a long fall or to be sown early as compared with bents and fescues.

Seaside courses and those situated in the latitudes of mild winters should begin clipping their putting greens very early in the spring. The short bursts of spring weather that are common to such localities cause unexpected growth of the grass. If this growth is clipped there will be little danger from "bald crowns" or "stubble" and their accompanying troubles.

The turf should be clipped late in the fall on seaside courses to avoid too tall grass in the spring.

Nurse grasses are not as much needed in fall seedings as in spring. The purpose of a nurse grass is to afford protection from extreme weather conditions, particularly hot weather, to offer some protection against mechanical injury, to assist in crowding out weeds, and to fill in between the plants of the basic grasses until the

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latter are large and strong enough to form the turf. They are also sometimes used to help keep the soil from washing.

Nurse grasses are more evenly distributed if sown alone and not as a part of a mixture, redtop being the exception.

A Mixture Reminder

In making up a grass seed mixture it should be remembered that equal parts by weight of the various grass seeds do not produce an equal number of living plants.

When computing the proportions for a seed mixture each variety of seed used must be considered for five probable losses.

1. Purity. The pound of "seed" purchased is not a pound of pure seed but contains weed seed, inert matter and chaff.

2. Germination. Not all the pure seed is viable.

3. Rapidity of germination. Some seeds germinate quickly while others require several weeks to be fully germinated. Some Kentucky bluegrass seeds apparently must be in the soil over a winter before they can germinate.

4. Cultural losses. Loss from birds, wind blown, too deep covering, no covering at all, erosion, fungus and insects and other losses that are bound to occur to new seedings.

Seeds Per Pound

5. The number of seeds in one pound is very important for there is a variation from 6,000,000 to 227,000 in the varieties used by greenkeepers.

Following is a table showing the relative amount of seed of various species of grasses necessary to obtain a number of plants approximately equal to those that can be expected from one pound of Colonial bent seed:

	Lbs.
Colonial bent 80-80	1
German bent 80-80 .....	.8
Redtop 95-90 .....	.75
Kentucky bluegrass 85-85	2.9
Chewings fescue	10
Italian or English rye	22
Domestic rye	16
Timothy	3.8

In computing the above table all probable losses have been considered. From it one can easily see that a mixture consisting of four parts by weight of Kentucky bluegrass and one part redtop seed does not produce a plant ratio of 4 to 1 but $4 \div 2.9 \times \frac{1}{4}$ or 1.04 to 1. Also a mixture of two parts German bent and one part domestic rye is not 2 to 1 but $2 \div .8 \times 16$ or 40 to 1.

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If Colonial bent is mixed with Chewings fescue in proportions greater than 2 to 1 the fescue plants will be so far apart that they will make tufts on a fairway and be of no use on a putting green.

Rye grasses to be of any use as a nurse grass must be in large proportion by weight to any of the basic grasses.

Redtop must be used with moderation or it will outnumber the basic grass.

Avoiding Cuppy Lies

Chewings fescue and redtop make an excellent fairway for sandy soils but the redtop will not remain more than a season and a half in fescue; therefore the fescue must be thick enough to cause a continuous turf after the redtop has disappeared, otherwise "cuppy lies" are the inevitable result on fairways. On greens, bare or weedy spots would be the result.

German bent does not need a nurse grass as there is usually plenty of redtop present.

Pre-seeding fertilizers should be used only after careful consideration of the probable results to be obtained from its use. Experiments and demonstrations have shown that on reasonably good soil where no pre-seeding fertilizer was used, the root growth was better than where fertilizers were used. Top growth was less but very hardy.

Nitrates and ammonia salts are not to be recommended as pre-seeding fertilizers as they stimulate too much leaf growth.

Grass Roots Lazy

Nitrogen for the young plants should be applied in a slowly available organic form, and such fertilizer should be worked into the top four inches of soil instead of the top inch. Grass roots are lazy and will not reach out for food if it is near at hand.

There is comparatively little loss of nitrogen from organic fertilizers, and many contain phosphoric acid, potash, magnesium, manganese, and calcium in small quantities.

An organic fertilizer applied as a top-dressing on new fall seeding is only slightly effective until spring. Then it will cause a luxuriant growth.

Phosphoric acid is generally conceded to assist root growth and therefore can be used to an advantage on any soil as a pre-seeding fertilizer.

Money invested in the preparation of the seed bed and topsoil will pay big dividends in lowered cost of maintenance of a desired quality. The soil can be "lightened," increased in organic content, and

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water-holding capacity, or drained better, easier, and at a lower cost before seeding than after.

Golfers are so anxious to get onto a new green or fairway that greenkeepers are forced to seed heavier than their judgment and good cultural practice dictates.

Too thick seeding of bents produces dampening off even in the fall. With all grasses it induces weak and spindly growth, yet I suppose it does crowd out the weeds.

How Heavy to Seed?

Let us assume that in a certain cubic foot of soil there is sufficient nitrogen (that is the most used element in growing turf) to supply 6,000 young seedlings and no more. Seeds that will grow 12,000 plants are sown on the area. What is the inevitable result? Spindly growth caused by the leaves reaching for light and not by fertilizer. At first, plants from late germinated seed and others naturally weak will disappear. Then almost simultaneously all of the remaining plants find themselves out of nitrogen. They then become weak because of retarded leaf growth and clover, tap-rooted weeds, and bare spots appear. If seeds enough for 3,000 plants are sown on the area the plants will be more healthy, deeper rooted and will not be starved.

Over-crowding of the grass plants as with persons does not permit normal development of the individual; also, there is the necessity for increased fertilization on crowded turf. How many "wonderfully thick" greens or fairways have we seen go bad because the food supply had been suddenly depleted, the caretaker thinking that the "beautiful and thick turf" could live forever, or money had been spent for seen "to get a thick stand" that should have been saved for fertilizer?

The writer is fully aware of the "too much theory" criticism that can be applied to the statements in this article. But think over those "theories" that have been written and those to follow and then use your own judgment. There is a fact back of each theory.

Let's consider just what seeding a green with South German bent at a rate of 10 lbs. per 1,000 square feet means. Assume we use 80-80 bent. This means 80% of one pound purchased is bent seed, 80% of which will germinate.

One pound of pure German bent seed contains well over 6,000,000 seeds. We will call it 6,000,000 to avoid an argument.

80% of 6,000,000 is 4,800,000. Therefore in one pound of seed as we buy it, there are 4,800,000 bent seeds. 80% of 4,800,000 is 3,840,000, the number of viable seeds. Cultural loss will account for 5% or 192,000, leaving 3,648,000 seeds that will develop into young plants. That means in 10 lbs. of German bent seed there can be expected 36,480,000 plants on 144,000 square inches of soil, if the rate of application is 10 lbs. per 1,000 square feet; or 250 plants per square inch. Isn't that rather thick? Won't it pay to figure the rate of seeding a bit theoretically?

Given the same quotation on two grades of Kentucky bluegrass seed, one 85-80 the other 80-85 which is to be preferred? Actual viable seed would be the same, but the 80-85 grade has 5% more impurities than the 85-80 grade.

Watch Weed Count

Chaff alone, reduces the seed count, but does not injure the seeding. It is the weed count that is to be carefully noted.

Prices quoted on a certain grass seed are: 90-90 @ \$.95 and 80-80 @ \$.85 per 100 lbs. Which is the better buy, price only to be considered?

One pound of viable seed from the 90-90 sample would cost $95 \div (.90 \times .90)$ or \$1.17, and one pound of viable seed from the 80-80 sample would cost $85 \div (.80 \times .80)$ or \$1.32.

Not only is the lower grade seed usually more expensive but one has to purchase more seed to get an equivalent stand of grass, adding to the carrying charges.

The following shows the amount of seed to purchase to obtain one pound of pure seed, from seeds of varying degrees of purity and germination.

Purity	GERMINATION					
	95	90	85	80	75	70
	Lbs.					
95....	1.1	1.17	1.23	1.31	1.40	1.50
90....	...	1.23	1.30	1.39	1.48	1.58
85....	...	...	1.38	1.47	1.56	1.68
80....	...	...	...	1.56	1.66	1.78
75....	...	...	...	...	1.77	1.9
70....	...	...	...	...	...	2.04

The facts and factors listed are not all that contribute to the success or failure of fall seeding. It is hoped that the article will have value in two ways. One, through the information it may impart, the other, that it will be so confusing (or clear) to those not actually caring for the turf, that they will realize that a greenkeeper has many things to consider even in one "little job" like fall seeding.