Spring Seeding

By Eugene Mayer

With the advent of spring and the assessment of our turf areas, we find in many cases that they are thin or even non-existent. This situation may occur on turfgrass areas devoted to aesthetic purposes, but is most often found on such high traffic areas as athletic fields.

The lack of turfgrass density may be attributed to disease or insect damage, poor fertility practices, use of incorrect turfgrass species, winter kill and, more than likely, to high traffic that caused excessive wear to the plant sward. No matter what the cause, the action plan is to correct the situation and re-establish the turf density that will provide beauty, utility and a good playing surface. This undoubtedly will involve either sodding or seeding.

While we all may know, through our educational background or own experience, that fall is the best time of the year to seed, we seldom have the luxury of waiting. The positive aspect is that spring is the second best time to seed cool season turfgrass species.

Why are the fall and spring months the best times to seed? Let's examine the process of seed germination for many of our turfgrass species.

Ideal Conditions

Using growth chambers, seed technologists have found the ideal conditions to germinate cool season turfgrass seeds. The primary conditions consist of moisture, light and temperature. Taking a closer look at each one of these factors, we can utilize some of these points in actual field conditions to obtain better seed establishment.

Moisture should consist of a substratum (blotter paper in the laboratory — soil in the field) moist enough to supply needed moisture to the seeds at all times. Light conditions should consist of eight hours of light and sixteen hours of darkness. Temperatures should alternate on a daily basis from 60 degrees F for sixteen hours and 78 degrees F for eight hours. This alternating temperature should coincide with the light regime. Therefore, for best seed germination, the conditions would be eight hours of light at 78 degrees F and sixteen hours of darkness at 60 degrees F. For bermuda-

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How to Calculate Fertilizer Nutrient Application Rates

The "formula" listed on the fertilizer bags gives the percentage of the major nutrients contained in that bag. For example, in the bag of 19-26-5 starter fertilizer, 19 percent of the weight of the fertilizer is nitrogen; 26 percent of the weight of the fertilizer is phosphorous; and 5 percent of the weight of the fertilizer is potash.

To determine the actual amount of each nutrient in the bag of fertilizer, multiply the weight of the bag by the percentage of that nutrient in decimal form.

To determine the actual nutrient content in a 100 pound bag of 19-26-5 starter fertilizer:

100 (pounds) x .19 (percentage of Nitrogen) = 19 actual pounds of Nitrogen;

100 (pounds) x .26 (percentage of Phosphorous) = 26 actual pounds of Phosphorous;

100 (pounds) x .05 (percentage of Potash) = 5 actual pounds of Potash.

To determine how many pounds of a specific fertilizer are required to reach a specific amount of one nutrient, divide the percentage of that nutrient (in decimal form) contained in the bag into the desired number of pounds of that nutrient.

For example, in the 19-26-5 starter fertilizer, to determine how much fertilizer is needed to reach the desired rate of 1 pound of actual phosphorous:

1 divided by .26 = 3.85 pounds.

Therefore, 3.85 pounds of fertilizer must be applied to the designated area (in this case 1,000 square feet) to supply 1 actual pound of phosphorous.

To determine the actual amount of the other nutrients within a bag of fertilizer when applying that fertilizer at a specific rate to achieve a specific amount of actual material for another nutrient contained in the fertilizer, multiple the number of pounds applied by the percentage (in decimal form) of the nutrient in question.

For example, to determine the actual amount of the other nutrients within the bag of starter fertilizer with a 19-26-5 formula when applying 3.85 pounds of fertilizer per 1,000 square feet to achieve 1 actual pound of phosphorous, multiply the number of pounds applied (3.85) by the percentage (in decimal form) of the nutrient contained in the fertilizer:

3.85 (pounds of fertilizer) x .19 (percentage of Nitrogen) = .73 actual pounds of Nitrogen

3.85 (pounds of fertilizer) x .05 (percentage of potash) = .19 actual pounds of potash.

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grass and other warm season turf seed, the temperature range is warmer, from 68 degrees F to 95 degrees F.

Comparing these laboratory conditions to field conditions, we find that fall and spring seasons most closely duplicate the ideal laboratory conditions. During the fall and spring, we have cool night temperatures with more dark hours than light hours and warmer daytime temperatures. This is one of the primary reasons that it is easier to germinate seeds in the fall and spring than it is in the middle of the summer.

Seed-to-Soil

Seed-to-soil contact also is basic to successful germination and seedling establishment. In northern climates, where freezing and thawing occur, seed could be broadcast on top of the ground to work itself into the soil with the freeze/thaw cycles. While this practice will work, it does carry a high risk of failure because seed-to-soil contact is dependent on the freeze/thaw cycles. In addition, under heavy rainfall, seed may float and wash to another area.

A better method of successful spring seedings in thin turfgrass stands is the use of slicer seeder machines. This type of equipment will slice small, thin grooves into the soil from an eighth to a quarter inch deep. Immediately behind this slicing action, seed is dropped into the groove and the soil will collapse over the groove and cover the seed. This method of seeding is much more successful than the broadcast method by itself.

If a slicer seeder is not available, other innovative techniques may be used to achieve seed-to-soil contact. This could consist of a drag harrow, spike harrow, rake or any other type of equipment that will scarify the top quarter inch of soil in a thin turf stand. Normally, the damage to existing turf is minimal if the equipment used isn't too harsh or severe. After the soil is scarified, apply seed and go over the area again with the same piece of equipment to work the seed into the soil or use a less abrasive piece of equipment such as a drag mat to cover the seed with soil.

Fertility

Another basic factor to follow for spring seeding, or any time you seed, unless it is on a weekly basis, is to use a starter fertilizer. A starter fertilizer contains nitrogen, phosphorous, and potash, with the phosphorous rate being greater than that of the nitrogen and potash.

Examples of starter fertilizers may be 19-26-5 or 16-25-12. In seeding, the objective is to apply about one pound of phosphorous per 1,000 square feet. With the example of 19-26-5, to meet the one pound of phosphorous rate, you would apply 3.85 pounds of actual fertilizer material per 1,000 square feet. This in turn would deliver .73 actual pounds of nitrogen, one actual pound of phosphorous, and .19 actual pounds of potash. (See box for calculation details.)

Germinating seedlings and young seedling plants need ample amounts of phosphorous and supplemental amounts of nitrogen and potash to become established quickly. With starter fertilizer, one can shorten the establishment period by two to three weeks.

Weeds and Water

With spring seeding, there also is danger that crabgrass and other annual grasses will become established. If this is a concern or a problem, siduron is the only pre-emergence herbicide that can be used to control germinating grassy annual weeds while permitting the desirable turfgrass to germinate and grow. Use the pre-emergent herbicide siduron at a rate of six pounds of active ingredient per acre. With the combination of siduron and starter fertilizer, successful seedlings can be established with little or no crabgrass infestation.

Moisture conditions are vital for seedling success. Soil moisture must be adequate and present on a continuous basis for at least the first twenty to thirty days. Any drying during this period brings a high probability that the seedling will die. Once this occurs, there is no way to revive that seed again, no matter how much we water. This moisture concept also helps explain the importance of seed-to-soil contact. Seed in contact with the soil has a greater probability of direct contact with moisture and has less exposure to the drying effects of sunlight or air. Most seedling failures are caused by inadequate continuous soil moisture during the first thirty days.

Seeding Rates

Seeding rates are not only the basis for successful seedings but also are important from a budget perspective.

There are times that much more seed is used than is needed because of the fear of failure. There is such a condition as too much seed. With high seeding rates, there is a risk of pythium disease, damping off and overcrowding of seedlings that result in weak plants that will not provide wear tolerance or survive under other stress factors. With the correct seeding rates, the turfgrass plants will be much healthier and provide better wear tolerance.

Seeding rates for different species are based on the number of seeds per pound and the results of research seeding trials evaluating different rates. For the improved Kentucky bluegrass varieties, there is a range from 1 1/2 pounds to three pounds per 1,000 square feet. Normally, a two pound per 1,000 square feet seeding rate is adequate.

Improved perennial ryegrass seeding rates may vary from three to five pounds per 1,000 square feet, with four pounds being the norm. Higher rates for use as permanent turf may result in weaker plants. The exception to this recommended practice is the use of perennial ryegrass for winter overseeding in warm season turf. Rates for winter overseeding may range from five pounds to 25 pounds of seed per 1,000 square feet. This type of seeding is intended to provide a temporary turf cover for the winter playing season only. Therefore, we must distinguish between seeding rates for permanent turf versus that for winter play only.

The criteria or objectives for some fields may require the use of the tall fescue species. Seed of tall fescue is large, resulting in fewer seeds per pound, and thus requiring higher seeding rates. Seeding rates should range from five to ten pounds per 1,000 square feet, with a norm of six to eight pounds.

Seeded bermudagrass varieties should be applied at a rate of one and a half to three pounds per 1,000 square feet.

Many seed recommendations call for seed mixtures between two or more species to capitalize on various performance strengths. A popular type mixture includes Kentucky bluegrass and perennial ryegrass mixed at various percentages based on the performance objectives. Seed rates for this type of mixture will range from two to four pounds per 1,000 square feet.

Another basic factor in seeding success is seed quality, but that topic deserves separate coverage. Do be aware that quality input produces quality results.

For successful spring seedings, you must practice the old cliché used in sports — get back to basics. Concentrate on the basics of moisture, temperature, daylight length, seed-to-soil contact, and seeding rates. If you use basic agronomic practices correctly, there is a high probability that your spring seedings will be successful and meet everyone's expectations. ❑

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