

CHALKBOARD

TIPS FROM THE PROS

GREAT POTENTIAL EXISTS FOR PREGERMINATION OF SEED

By Nicholas R. Spardy

Pregermination of seed is essential to turfgrass management today. Sports turf managers are expected to produce a cosmetically appealing and durable turf in a short period of time. While it is currently being used on a limited basis by a few turfgrass managers, the potential for pregermination, especially where accelerated establishment is necessary, is now being realized.

The rate of establishment of pregerminated seed is much faster than if seed was just applied to the soil and covered. The sports turf manager can expect playable turf within weeks of application. Pregerminated seed is also useful to repair divots so that athletes will not injure themselves by stumbling or tripping over divots or depressions. Divot repair also improves the appearance and playability of sports turf.

Successful methods for pregermination should provide quicker germination in inclement weather or when use dictates that a turf stand is needed before it is possible to establish turf by conventional means.

Pregermination is simply a process that incubates the seed off-site. The seed is placed in an environment that is favorable to germination before it is applied to a field, tee or fairway for growth. The seed is then applied after it is either swollen or the radicle (the first root) has emerged, whichever is preferred for the given situation.

There are at least six different methods of pregermination that are currently used by sports turf managers throughout the United States. Tests at Cal Poly Pomona in 1987 compared the success of each method. All but one provided at least 72 percent germination of perennial ryegrass within seven days.

With the Northrup King method seed is soaked in small burlap bags in a tank of water. After 12 hours in water the bags are removed from the tank and hung up to dry for another 12 hours. This cycle is repeated for seven days.

In the Candlestick Park method 50 pounds of seed are mixed with 100 pounds of Lapis sand and 150 pounds of Turface (processed calcined clay). The material is watered thoroughly, drained and pushed into mounds. The mounds are checked daily and kept moist.

Seed is placed directly into tanks or 55 gallon drums filled with water in the Kansas City method. The water is changed every 12 hours. By changing the water, oxygen in the water is replenished and exudates



Seed following seven days of pregermination.

given off by the seed during germination are reduced. These exudates seem to inhibit germination if not removed.

The wetting agent Aqua-Gro is mixed with the water at a rate of two ounces per 55 gallons of water in the Milwaukee Brewers method. Water in the drums is changed every four hours for three days. On the third day or after the seed has become swollen, the seed is removed from the water and mixed with Milorganite fertilizer (6-2-0). The mixture is spread out and left until it becomes semi-dry.

Based on the previous four methods, Cal Poly devised two more methods for testing. The first soaks the seed in water-filled drums like the Kansas City method. The water is changed every 12 hours. A small aquarium pump is used to continuously aerate the water. The second is the same as the first, but Aqua-Gro is added on the third day of soaking.

Initial germination was observed on the third day of the study. Early averages ranged between one to seven percent germination. By the fourth day the percentage of germination jumped to roughly 40 percent for most of the methods. By the fifth day, the Candlestick Park, Kansas City and the Cal Poly methods provided approximately 70 percent germination. The studies indicate that all methods evaluated exhibited germination percentages above 70 percent for perennial ryegrass and above 80 percent for annual ryegrass.

The highest amounts of germination of perennial ryegrass were seen after seven days in the Kansas City and the first Cal Poly methods, 89 and 90 percent respectively. Candlestick Park had 86 percent germination after seven days.

The Cal Poly method which used air bubbled through water, and the Candlestick Park

method consisting of a porous planting mix had the best topgrowth both in height and quality. Kansas City also produced good topgrowth.

The Milwaukee Brewers method became infested with a fungus apparently due to high humidity in the laboratory. Normally this method is done in a cool, outdoor area with lower humidity and greater air movement.

The Northrup King method was modified afterwards by Dr. David Kassnoff, NK's turf breeder, for further testing. A pump and a circulation immersion heater were added to the water tank. Water temperature and aeration were found to be important keys in realizing rapid germination. In experiments using perennial ryegrass it was found that 90 percent germination was reached in eight to nine days when the water temperature was maintained at 68 degrees F. When the water was kept at 77 degrees F., the same germination was achieved in three to four days. The results suggest that 77 degrees F. is a favorable temperature to pregerminate perennial ryegrass.

In similar tests, 90 percent germination of Kentucky bluegrass seed was achieved in seven to nine days when water temperature was maintained at 77 degrees F. This could be a benefit to managers of Kentucky bluegrass sports turf who would like to speed up germination for reseeding.

It is hoped the results of this study will be beneficial to all turf managers. Each method offers different procedures and a different approach to this important aspect of sports turf management. □

Editor's Note: Nicholas R. Spardy conducted the preceding research as a senior under Dr. Kent Kurtz at Cal Poly University, Pomona. Today he is western regional turf specialist for Northrup King.