

# TECHNIQUES FOR PREGERMINATION OF COOL SEASON TURFGRASS SEEDS

By Mark Grundman

Turfgrass managers have been looking for methods of establishing turf areas in other ways than normal seeding procedures. Sodding has been used for several years. However, there are some situations where sodding turf areas would either be logistically or economically infeasible. Pregermination techniques seem to fit a niche here. With the exception of the initial set up cost and space requirements, pregermination techniques would most likely be a less expensive way to establish turf areas in certain situations. Those situations include a.) a need for quicker germination in inclement weather such as cold, and b.) when a turfgrass stand is needed before it is possible by normal seeding methods. The objectives of this paper are to review various procedures for pregermination of cool season turfgrass seed and to give some procedures which have been successful for the distribution of pregerminated seed on the turf areas to be renovated.

Dr. Kent W. Kurtz and Nicholas R. Spardy reviewed several procedures for pregerminating seed. These procedures will give a good cross section of the various procedures used in the United States. The following procedures will be presented in this review:

1. Northrup King Method
2. Candlestick Park Method
3. Kansas City Method
4. Milwaukee Brewers Method
5. Cal Poly-Pomona Method  
Developed by Kurtz and Spardy
6. Kansas City and Cal Poly-Pomona Method with the use of Aqua-Gro
7. Modified Northrup King Method  
Developed by Casnoff

I would like to cover each of these methods separately.

## 1. Northrup King Method

- a. Seed placed in small burlap bags.
- b. Seed soaked for 12 hours.
- c. Remove seed from soaking tank.



- d. Hang bags up to dry for 12 hours.
- e. This 12 hour (dry/soak) procedure is continued for 7 days.

## 2. Candlestick Park Method

(Basically used to repair field divots from ball player shoe traffic, etc.)

- a. Incorporate the following ingredients for large scale field repair
  1. 150 lbs. of Turface (calcined clay and clay).
  2. 100 lbs. of Lapid sand.
  3. 50 lbs. of seed.
- b. Water layers thoroughly and allow to drain excess water.
- c. After watering the mixture is pushed into mounds and checked daily to make sure the seed/soil mixture is moist.

## 3. Kansas City Method

- a. Seed is soaked with water
- b. Water is changed every 12 hours (to replenish oxygen that is necessary for seed germination).
- c. Water changes could also periodically reduce the amount of exudates apparently produced by the seed during the germination process. These exudates seem to inhibit germination.

## 4. Milwaukee Brewers Method

- a. Aqua-Gro is used at a rate of 2 ounces per 55 gallons of water.
- b. The water/Aqua-Gro solution is changed every 4 hours.
- c. On the 3rd day after seed has become swollen, they are spread out and mixed with milorganite fertilizer (6-2-0).
- d. Mixture is left until it becomes semi-dry.

## 5. Cal Poly-Pomona Method

- a. Soak seed in water every 12 hours.
- b. Small aquarium pump is used to continuously aerate water.
- c. This process is continued until maximum germination is achieved.

## 6. Kansas City and Cal Poly-Pomona Method with the use of Aqua-Gro

- a. Both methods are the same as previously described.
- b. Aqua-Gro is added on the third day of soaking.

Kurtz and Spardy showed that all the above procedures were very effective in terms of pregerminating seed. The highest amounts of germination of perennial ryegrass after seven days were seen in the Kansas City and Cal-Poly-Pomona methods.

The modified Northrup King method was modelled after the Cal-Poly Pomona Method. In this method the seed is put into canvas bags. The seed is continuously soaked and during this period the water is changed every 12 hours. The water is continuously aerated using a small aquarium pump. The only change from the Cal-Poly method is the use of the circulator immersion heater which is hung from the side of the soaking tank. The tank was built out of fiberglass and measures 3 feet wide by three feet long by 2 feet deep. The water temperature and aeration status were found to be major keys in realizing quick germination. In experiments using perennial ryegrass it was found that 90 percent germination (measured by emergence of the radi-



cle) was reached in 8-9 days when the water temperature was kept at 68° F and was reached in 3-4 days when water temperature was kept at 77° F.

A study was conducted using two species of cool season grasses to investigate the number of days to the 90 percent radicle emergence when the water temperature in the soaking tank was held at 77° F. It took an average of 3-4 days to get 90 percent of the seed of various perennial ryegrass varieties to germinate and it took an average of 7-9 days to get 90 percent of these several Kentucky bluegrass varieties to germinate. These data suggest that 77° F is a favorable temperature to pregerminate perennial ryegrass. More research is needed to see whether higher or even lower temperatures are needed to germinate Kentucky bluegrass more rapidly.

Once the seed is germinated the problem exists as how to distribute the seed onto a turf area to be renovated. A few ideas will be presented here. In two areas at Radnor Valley Country Club in Radnor, PA a practice tee renovation project and an experimental ryegrass plot areas were being planted late in the fall (mid-October). A way to establish these areas before the onset of winter was needed. Pregermination techniques were an excellent alternative to the normal seeding procedures or to the expense of sodding. It was felt that normal seeding procedures would not produce healthy, vigorous turf plant before winter set in. On October 10th, 10 lbs. each of 7 experimental ryegrasses were pregerminated using the modified Northrup King Method with the soaking water held at 77° F. On the 13th of October the seed was emptied into plastic flats for 24 hours. This allowed excess water in the seed to drain. On October 14th it was observed that the seven perennial ryegrasses averaged from 80-90 percent radicle emergence. Each of these varieties were separately mixed with vermiculite. We used vermiculite due to the fact it was available to us in large quantity (mixed 1:1, volume:volume). Interestingly enough the seed/vermiculite mix was moist enough to travel 100 miles to the renovation site without drying out. Secondly the mix was dry enough that a Gandy drop spreader could be used to distribute the seed without any major problems. The experimental plot area was seeded by hand. The remnant seed was then mixed and spread over the practice tee area using a Gandy drop spreader. The experimental plot area

was rolled to get good seed to soil contact. No supplemental water was available at this site. In contrast the practice tee area was irrigated for 5 minutes to moisten the seed bed. No other supplemental water was used. No rolling was done at this site. In both cases turf areas were 100 percent covered with what seemed to be vigorous seedlings. The weather during this establishment period was less than optimal. The temperatures averaged 45-50°F highs with frost on several mornings during the three week period. These results were well above expectations of the club membership as well as myself and the superintendent (Tom Dale). These results suggest that pregermination techniques can work to the benefit of the turfgrass manager in certain situations. The key is *planning*. These procedures take time and good preparation to get everything to run smoothly.

One other experiment planned to investigate another method for seed distribution will be performed in early spring of 1988. This experiment will use pregerminated bluegrass seed and will be conducted with the cooperation of

Sporting Valley Turf Farms. It is believed that if seeding of turfgrass sod areas can be achieved earlier in the spring than usual, turfgrass plants can be better established before the onset of the summer drought as compared to those plants established using normal seeding methods. We plan to spray pregerminated bluegrass seed out of a spray rig set up with a 15 foot long boom with 5, #10 flood jet nozzles evenly spaced on the boom. The spray rig will operate using a hydraulically actuated centrifugal pump. A half-acre area will be established using this sprayer and a half-acre area will be established using a Brillion Cultipacker Seeder. A Cultipacker will be used over the spray seeded area to get good seed to soil contact. We should get some good data by May of 1988.

As time goes on, more information will be gathered that should assist both in improvements in technique for pregerminating seed as well as distributing pregerminated seed over turf areas to be renovated. Warm season turfgrass pregerminating techniques will also be evaluated.

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