

Growing sod over plastic: turf in five weeks

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Interest in growing grasses in various media over plastic sheeting has grown recently.

Turf grown by O.M. Scott & Sons in 1965 proved that, given appropriate care, you can maintain a grass sod on concrete or any impermeable base as long as you have sufficient water and nutrients.

The basic idea is compelling: by placing a suitable growing medium and seed over plastic sheeting (in our case, 1- to 6-mm polyethylene sheeting), and irrigating it carefully, a tall fescue sod, for example, can be formed in as little as five weeks. The entire primary root system remains intact: unable to penetrate the plastic sheeting, the roots run laterally. They rapidly form a fibrous root mass that binds and knits the sod so that it can be harvested and handled in just a few weeks rather than the typical one to two years.

The new sod can be harvested by simply rolling it off the polyethylene sheeting which is left in place to be used again for subsequent sod crops. Since the sod is harvested with the root system intact, rather than being severed by a sod cutter, the sod binds and roots rapidly to a new site.

Good news, bad news

There are several other significant advantages to the process:

- Since the sod is grown in only a few weeks, much less water, fertilizer, and mowing are needed.

- Depending on the growing medium, the sod can be produced lighter than even a peat sod.

- The sod can be harvested and laid in large rolls (5 by 45 feet to give sod rolls of 25 square yards or more) which can eliminate a great deal of manual labor.

Despite the obvious advantages, several difficult problems have been encountered. First has been the availability of a plentiful, inexpensive, growing medium. Hundreds of materials appear to work in a greenhouse only to be quickly eliminated when considered on a field scale.

Second, the amount of growing material required to cover an acre sheet of plastic one inch deep translates into more than 130 cubic yards. That is too many dump truck loads to be competitive with the conventional sod on soil process.

Third, placing an exact amount of



The availability of composted sludge and the arrival of tall fescues make the concept of growing sod over an impermeable base more feasible.

growing material in a thin layer evenly over acres of plastic film without distortion is a challenge. Rainfall — whether it be a drizzle or a downpour — compounds the problem.

Conventional sodding is very labor intensive. Significantly reducing the amount of hard labor involved has to be a prime attribute of any alternative sodding system.

Positive developments

Starting in the 1980s, several things helped make an alternative sodding system more feasible:

- The Beltsville system of composting sewage sludge began to catch on. Suddenly, at least in Ohio, an inexpensive growing material became available that is charged naturally with the right nutrients for grass culture.

- Techniques were developed to spread the growing medium evenly, to protect it from distortion in thunderstorms, and to reduce the quantity required to affect a sod.

- Turf-type tall fescues have been introduced. These new turf cultivars have several apparent advantages over bluegrass: they are more drought tolerant, possibly more shade tolerant, disease- and insect-resistant. They are more durable on playing fields, germinate and root more quickly and are more vigorous than bluegrass.

On the other hand, the tall fescues do not produce rhizomes and stolons. Hence, they do not lend themselves easily to conventional sod production. In practice, these drawbacks are com-

pensated for by growing the sod for a longer than usual period, by including sod netting, and/or by adding bluegrass to the tall fescue seeding.

Thanks, tall fescue

These apparent disadvantages to growing a tall fescue sod in a conventional manner turn out to be strengths when tall fescue is considered as the main ingredient of an alternative sod grown on a solid base. The vigorous and rapid primary rooting gives the tall fescue cultivars a distinct advantage over the less vigorous bluegrasses.

With sod netting, we can easily grow in five weeks a bona fide tall fescue sod that expert grass men judge to be of comparable, even better, quality than conventional, soil-grown tall fescue sod.

In 1988 experiments supported by the National Science Foundation, we tested four different readily-available waste materials: composted sewage sludges from Columbus ("Com-Til") and from Akron ("Organix"); a spent mushroom soil from the Campbell Soup mushroom production facility in Jackson, Ohio; and composted feed lot waste from stockyards in South Charleston, Ohio.

Controls consisted of a typical Ohio clay loam field soil and a mix of one-half field soil and one-half Com-Til. These were tested simultaneously in irrigated, 2,000 square foot test beds and in greenhouse pots at Ohio Wesleyan University. Selected turf cultivars were the bluegrasses Midnight, Adelphi, Banff, Mo-

nopoly, America, and Nassau; and the tall fescues Jaguar and Rebel II.

Good results

The tall fescues reached an average height of 27 cm four weeks after planting on the waste materials as on the controls. They grew at least twice as fast as the bluegrasses on all waste materials. The bluegrasses averaged heights of 15 cm on the controls, 11 cm on the composted sludges and feed lot wastes, and only 6 cm in four weeks on the mushroom soil.

The sewage sludges had to be

"leached out" prior to seed germination with the seedling root growth proportional to the amount of leaching. In the field this translated into intense irrigation (four inches of water per week) for the first two weeks of planting.

Despite a record drought over the 1988 summer, we were able to prove conclusively that it was possible to substitute waste materials for topsoil and to produce consistently high quality tall fescue sods in short periods.

With certain pre-conditions, it would not be unreasonable to assume

that a perfectly serviceable tall fescue sod could be produced in as little as a month.

Saving time, space

Surprisingly, because of the drought, after the first two weeks of initial growth the tall fescue sods grown on plastic needed less water to maintain in prime condition than our conventional bluegrass sods on soil. And acceptable tall fescue sods were being produced with as little as 20 cubic yards of waste material per acre. The optimum was in the range of 40 to 50 cubic yards per acre. No pesticides or adjuvants were needed.

Bluegrass sods are much more difficult to produce than tall fescue sods. (A hot summer on plastic is probably asking too much of bluegrasses.)

In 1989 summer experiments, we hope to be able to study the effects on bluegrass seedlings of intermittent, cool, deep, well water and to look for bluegrass cultivars that have greater drought tolerance and other favorable characteristics.

Smart waste disposal

Another attractive feature of this innovative growing process is its broad application on a national scale. Since the growing medium is contrived or constructed from waste materials—such as composted sewage sludge—substantial amounts of topsoil would be saved. And an obviously troublesome, ever-expanding waste material would be handled effectively, efficiently, and disposed of safely.

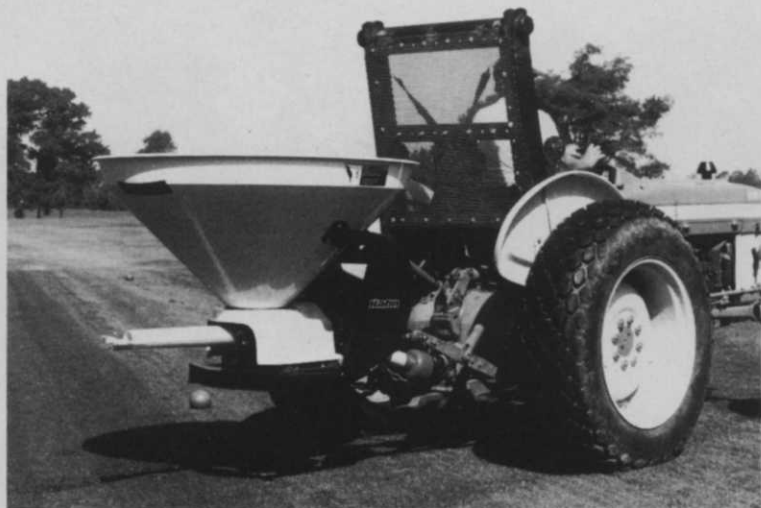
It has been estimated that only five percent of the U.S. annual cultivated sod production (estimated at 250,000 acres a year) devoted to this growing process using sewage sludge as the main ingredient of the growing mix in place of topsoil, production would be the equivalent of using the total dry sludge production of Boston, New York, Philadelphia, Washington, and Chicago combined.

When the capacity of the new sod growing system to produce four to eight crops per year is factored in, then it can be calculated that only about 1,500 to 3,000 acres of growing surface would be needed for all of these cities.

If the technology of the earlier research can be refined and adapted to cost effective production on a large scale then an entirely new avenue of resource recovery will be introduced into the handling and disposition of otherwise troublesome waste materials. In addition, a better and more economical method of growing grass sods, which also conserves topsoil, will be introduced. **LM**

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