Decision Time: Sod or Seed?

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Are you doing some construction or renovation and have the option of establishing turf from sod or seed? A quick telephone call to a local landscaper will tell you that the costs will be in the range of $260/M for seeding and $600 for sodding. The costs stay relatively the same even if the work is going to be done in-house. Looks like a no-brainer, doesn't it? Maybe not.

Looking at only the installation cost may not be the way to go. Depending on the situation, there are some hidden or long term costs that you may not be thinking about that could change your mind. That's what this article explores.

The regulators are everywhere these days. Chances are that if you're about to establish turf anywhere near "waters" of the state, you have to abide by certain codes. If seeding on slopes, you're going to have implement some type of an erosion control measure. Let's assume this brings erosion control mats into picture. This leads us to a recently completed study on the effectiveness of different types of mats and compared them to a straw mulch and sod. I added in some cost figures.

Type of establishment	Type of mulch or mat	Cost/M
Seed	Straw	$258
	Wood excelsior	332
	Jute mat	348
	Coconut mat	511
Sod	-	595

Notice how quickly seeding costs can approach those of sodding. Now the issue becomes, which of the above provide the degree of erosion control required and provide the best turfgrass stand possible? These questions were addressed for slopes of 8 and 16 %.

	Soil erosion - lb/M		Turfgrass stand uniformity*	
	8 % slope	16% slope	8% slope	16 % slope
Seed + straw	5.2	18.9	8.5	7.5
Seed + wood excelsior	9.4	23.8	8.3	6.6
Seed + jute mat	4.9	11.7	8.5	7.8
Seed + coconut mat	10.4	33.2	7.9	6.2
Sod	0.2	3.7	10.0	10.0

* Scale of 1 to 10 with 10 being perfectly uniform.

These results clearly show that had you or someone else made the decision that mat effectiveness = cost, seeding would have cost nearly as much as sodding and would have been far less effective in terms of erosion control. Also note the effectiveness of plain old straw mulch and its cost. The turfgrass stand uniformity ratings were taken 4 months after turfgrass seeding and lead to something else I want to talk about. But, first, let's go to the issue of mulch type. Tom Schwab and I conducted a study on this a few years ago. We compared chopped straw with the pelleted paper muches, Pennmulch and Establisher, and AmTurf paper mulch. Our findings are summarized below.

Type of mulch	Seed wash	Stand uniformity	% Ground cover
Pennmulch	5.6	7.2	74
Establisher	4.5	6.2	60
AmTurf	8.0	7.6	71
Chopped straw	5.0	8.5	84

The amount of seed wash and stand uniformity are on scales of 1 to 10, where 10 = zero seed wash or a perfectly uniform stand of turfgrass. Seed wash was the result of a heavy rain 5 days after seeding. Stand uni-

formity was recorded 2 weeks after seeding and percent ground cover after 3 weeks. As the numbers show, straw performed as well or better than the paper-based products and did so at considerably lower cost.

Now back to the issue of the differences seen in turfgrass stand uniformities for the different types of erosion control mats or the different mulches. One of the consequences of these differences in turfgrass stand density and uniformity during the establishment year for turfgrass was manifested last season in plots established in 2001 at the Noer Facility. These are 6 large plots consisting of mono-stands of creeping red fescue, turf-type tall fescue, perennial ryegrass, a 4-way blend of elite Kentucky bluegrass cultivars, the "Madison Parks" mix of fine fescue, perennial ryegrass and Kentucky bluegrass and sod grown from an elite blend of Kentucky bluegrasses. The plots are split in two directions, one for different mowing heights and the other for differences in annual fertilizer N rate. Differences in turfgrass stand density and uniformity were readily evident at the end of year of establishment. The consequences with respect to weed invasion in 2002 follow. First we'll look at the comparison between Kentucky bluegrass seeded and sodded. Weed counts in early September tell the story.

Treatment	Crabgrass population	Broadleaf weed population
	number/1,000 ft²	
Seeded: mowed at 1.5 in.	1225	429
2.5 in.	1026	265
3.5 in.	218	175
Sodded: mowed at 1.5 in.	55	434
2.5 in.	44	66
3.5 in.	19	62

The effect of mowing height on weed populations tells a lesson by itself. Averaging across all 3 mowing heights, sodding resulted in 958% less crabgrass and 35% less broadleaf weeds than did seeding. The implication is that when we look beyond just establishment and factor in maintenance costs such as weed control, sodding takes on new light. In 2003 we'll see what it takes and how effective we are in bringing these weed populations under control with herbicides.

Mowing height isn't the only thing that influences turf density and the opportunity for weed seed con-

tact with sufficiently moist surfaces where germination and establishment can take place. Nutrition also plays a role and nitrogen is the key nutrient. As shown below, the impact of nitrogen management on weed populations was evidenced in our plots.

Establishment method	Annual N rate	Crabgrass population	Broadleaf weed population
	lb/M	number/M	
Seed	1.0	1237	889
	2.0	1065	109
	3.0	897	104
	4.0	390	88
Sod	1.0	140	494
	2.0	11	109
	3.0	5	58
	4.0	0	42

The above weed populations are those averaged across all 3 mowing heights. This makes the lack of crabgrass in the sod fertilized with 4.0 lb N/M even more notable because at this N rate there was no invasion of the sod by crabgrass. Broadleaf weeds were absent in the sodded plot if the mowing height was 2.5 inches or higher and at least 3.0 lb of N were applied. In other words, by sodding and imposing the proper cultural practices, there was no need for herbicide applications in the first year after establishment. In contrast, no combination of cultural practices eliminated the need for herbicides in the seeded plot. If the sodded area continues virtually weed free for a number of years, the point could eventually be reached where the long term costs of sodding become equal to or may even decline below those of seeding. Only time will tell.

If you're establishing roughs, you may be interested in turfgrasses other than Kentucky bluegrass. One option often considered is the so-called "low input" fine fescues. Based on my observations in this study, that may be a misnomer and the term might better be applied to the turf-type tall fescues. The basis for this statement lies in the weed populations we found in the plots seeded to something other than Kentucky bluegrass. To simplify matters, I'm presenting only the average high and low weed populations and the cultural practices required to achieve the lowest populations.

Turfgrass established	Highest weed population	Lowest weed population	Lowest population practices
	number/M		
Creeping red fescue	2044	265	3.5 inches, 4.0 lb N/M
Turf-type tall fescue	109	0	> 1.5 inches, > 1.0 lb N/M
Perennial ryegrass	936	0	3.5 inches, 4.0 lb N/M
Madison Parks mix	842	0	3.5 inches, 4.0 lb N/M

Two things stand out in these weed populations. One is the fact that creeping red fescue was the most prone to weed invasion under any set of cultural practices. This prompts the question, "In the long run, is fine fescue really a low maintenance turfgrass?" The other thing to note is how well the turf-type tall fescue kept out weeds, even at an annual N rate of 2.0 lb/M. This I attribute to the fact that this grass germinated faster than any of the others, more quickly achieved 100% ground cover, and at the 6 lb/M seeding rate employed, has thus far maintained a higher stand density than any of the other grasses. This winter is providing a good test of differences in cold weather tolerance among the different species. How they fare will influence their susceptibility to weed invasion next summer.

There are few, if any studies on the long term costs of seeded versus sodded Kentucky bluegrass. The same holds true for seed establishment of different turfgrass species. Until such studies are conducted under different sets of conditions that have different demands as far as erosion control is concerned, a final answer to the question, "Sod or seed?" cannot be given. But I think you'll agree from the data presented here that we need to look beyond just installation costs.