

COMPARATIVE SOD STRENGTHS AND TRANSPLANT SOD
ROOTING OF KENTUCKY BLUEGRASS CULTIVARS AND BLENDS

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The first three years of a six year program of sod production investigations have now been completed. The basic plan for this work was as follows. Individual cultural practices were to be investigated during the initial three years to determine which ones were best when compared strictly on an individual basis. Studies have now been completed concerning (a) fertilization rates and timing; (b) mowing heights and frequencies; (c) establishment techniques in terms of timing, seeding rate, and wind stabilization; and (d) comparisons of the preferred cultivars, blends, and mixtures for rapid sod strength development.

During the next three years the primary objective will be to combine the best of these cultural practices into various cultural systems to determine which results in the most rapid rate of sod formation. The post-harvest cultural studies involving techniques and methods of transplanting are also continuing. Emphasis will be given during the upcoming year to methods of sod transplanting in shaded sites.

Not all of the work completed during the past year will be summarized in this paper since much of it was included in the Sod Production Field Day Program published and distributed in June of 1971. However, the collection of data on sod strength and sod rooting was continued through the 1971 growing season and has now been completed. This work is summarized in this paper.

COMPARISONS OF SOD STRENGTH AMONG THE KENTUCKY BLUEGRASS CULTIVARS

The Michigan Sod Strength Test was first developed at Michigan State University in 1965. The technique has been refined and improved in subsequent years and has now been adapted for use in experimental work at a number of other universities including New Jersey, Rhode Island, Maryland, Minnesota, and Guelph.

Sod strength measurements among cultivars have been taken on three different plantings made in August of 1968, 1969, and 1970 at the MSU Muck Experimental Farm. The measurements were made at two to three intervals throughout the growing season for each of these plantings. Thus, a very good representative evaluation of the comparative sod strengths has now been obtained. The 1971 data is presented in Table 1.

Table 1. Relative sod strengths of 28 Kentucky bluegrass cultivars

Cultivar	Date Lifted		Average
	7-21-71	9-14-71	
Baron	187	131	159
Fylking	188	108	148
Sodco	174	111	142
Nugget	186	87	136
Sydsport	154	119	136
Arista	167	102	134
Pennstar	151	110	130
S-21	132	116	124
Adorno	137	109	123
Primo	138	98	118
Belturf	134	88	111
Palouse	99	114	106
Campus	88	123	105
Prato	106	102	104
Windsor	60	148	104
A-34	141	62	101
Merion	99	102	100
Delft	110	87	99
Geary	104	83	93
Park	81	97	88
Delta	100	77	88
Newport	67	95	81
Cougar	91	67	79
Captan	81	77	79
Monopoly	83	64	74
South Dakota Cert.	67	78	72
Kenblue	39	103	71
Atlas	30	80	55

It can be noted from the data in Table 1 that the sod strengths ranged from a high of 187 pounds to tear the sod to as low as 30 lbs. At least 80 to 85 lbs. is generally desirable for harvesting and transplant handling. The poor sod strength of certain cultivars for August 21, 1971, is caused primarily by greater susceptibility to Helminthosporium leaf spot. Based on these results and earlier data taken since 1968, the relative sod strengths of 22 Kentucky bluegrass cultivars are summarized in Table 2.

Table 2. Relative sod strengths of 22 Kentucky bluegrass cultivars.

Excellent	Good	Intermediate	Poor	Very Poor
Nugget	Belturf	Prato	Cougar	Park
Baron	Primo	Palouse	Delta	Kenblue
Pennstar	Merion	Campus	Monopoly	
Sydsport	A-34	Geary		South
Fylking	S-21	Windsor		Dakota
Sodco		124		Cert.

Cultivars ranking superior in sod strength include Nugget, Baron, Pennstar, Sydsport, Fylking, and Sodco. Thus, most of the Kentucky blue-grass cultivars that have ranked superior in terms of general turfgrass quality and disease resistance also rank quite well in terms of sod strength. As a group, they are ranked better than Merion Kentucky blue-grass which has been the standard over the years.

COMPARATIVE SOD STRENGTHS RESULTING FROM THE BLENDING OF KENTUCKY BLUE-GRASSES.

As in the previous study, eleven selected blends of Kentucky blue-grass have been evaluated at three different plantings from 1968 through 1970. Results of these studies are summarized in Table 3.

Table 3. Relative sod strengths of 11 Kentucky bluegrass blends.

Percent Composition						Pounds to Tear
Fylking	Merion	Newport	Park	Prato	Windsor	
33				33	33	116
	50			50		106
		33		33	33	102
33	33		33			100
33		33	33			99
50	50					98
	50				50	98
33	33				33	97
	50	50				88
	33	33	33			87
	50		50			82

In studying the results over the entire test period, no one blend or group of blend has ranked consistently superior. In general, the blends do not rank as high or as low in sod strength in comparison to any one of its individual components. Apparently, the blending of two or more of the Kentucky bluegrass cultivars causes a moderation of the extremes in the overall sod strength of the blend. No great differences have been evident between the blends providing the blend contains one or two cultivars characterized by good leaf spot resistance and sod strength.

The basic concept of blending is more important since it ensures a wider genetic base. Thus, the components of the sod, when transplanted onto the consumer site, will have a wider adaptive ability to environmental, soil, and disease conditions.

COMPARISONS OF THE TRANSPLANT SOD ROOTING ABILITY OF KENTUCKY BLUEGRASS CULTIVARS

The same experimental areas utilized in the Michigan Sod Strength Tests were also used to evaluate the transplant rooting of 20 Kentucky bluegrass cultivars. Three of these tests have been conducted, one time from a 1969

seeding and three times from a 1968 seeding. The sod was produced on an organic soil and subsequently transplanted onto a mineral soil on the MSU turf plots at East Lansing. The actual data for four different lifting times are presented in Table 4.

Table 4. Relative transplant sod rooting of 20 Kentucky bluegrass cultivars (Pounds to life*)

Cultivar	Date Sod Was Lifted				Average
	11-6-70	7-2-71	9-9-71	11-2-71**	
Belturf	65	98	61	80	77.5
Campus	67	71	71	85	73.5
Captan	61	77	68	55	65.2
NJE-27	54	69	65	61	62.2
Monopoly	49	70	56	71	61.5
A-34	45	80	61	55	60.2
Pp-1	55	64	65	54	59.5
Fylking	48	66	42	51	51.7
Nugget	24	81	60	40	51.5
Newport	51	53	38	63	51.2
Kenblue	65	20	51	68	51.0
Pennstar	38	65	47	51	50.4
Delta	67	23	41	59	47.5
Windsor	61	k0	49	61	45.2
Arboretum	54	27	53	--	44.5
Prato	53	15	53	51	43.0
Merion	48	37	20	55	40.0
Park	60	***	22	63	36.2
Cougar	49	21	15	51	34.0
South Dakota Cert.	58	***	17	61	34.0

* Average of 3 reps.

** Taken from 1969 seeding, all others from the 1968 seeding.

*** Too weak to measure.

The transplant sod rooting strength in these studies ranged from a high of 80 pounds to sods which did not root at all. The inability of certain cultivars to root prior to the July 2, 1971, lifting date was caused by severe thinning of the stand by *Helminthosporium* leaf spot. Substantial difference was observed in the transplant sod rooting ability among cultivars. The cultivar response varied with the particular time of year. These effects are summarized in Table 5.

Table 5. Relative transplant sod rooting of 15 Kentucky bluegrass cultivars expressed on a seasonal basis.

Relative Ranking	Autumn and spring**	Summer	Overall
Excellent (85lb.)	Campus Belturf Kenblue	Belturf Nugget A-34	Belturf Campus
Good (58 to 65 lb.)	DELta Park Windsor South Dakota Cert.	Campus Fylking Pennstar	A-34
Intermediate (51 to 57 lb.)	Newport Prato Merion	Newport	Fylking Nugget Newport Kenblue Pennstar
POor (36 to 50 lb.)	Fylking Cougar A-34 Pennstar	Kenblue Delta Merion Windsor	Delta Windsor Prato Merion
Very Poor (35 lb.)	Nugget	Prato Cougar Park South Dakota Cert.	Park Cougar South Dakota Cert.

* Pounds based on the Michigan Sod Rooting Test.

** Non-leaf spot periods.

Note that some of the leaf spot susceptible cultivars such as Kenblue, Delta, and Park have superior transplant sod rooting in both the fall and spring period but rank quite low during midsummer when leafspot thinning is severe. On the other hand, a number of improved Kentucky bluegrass cultivars in terms of disease resistance such as Nugget, Pennstar, Fylking, and Merion, rank much lower than desired. Merion falls in the poor category on a seasonal basis.

These data suggest that it would be desirable to include one of the cultivars with superior transplant sod rooting ability, particularly in the spring and fall period, in a Kentucky bluegrass blend. The most obvious choices among this group are Kenblue, Delta, and Park in terms of seed available on the American market. Thus, even though these cultivars are highly susceptible to leaf spot, they still have certain desirable characteristics that may justify retaining them as a component in a blend of Kentucky bluegrass cultivars.