Kentucky bluegrasses making comeback

By Mark Leslie

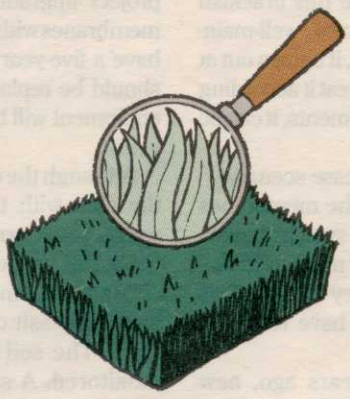
There is a resurgence in Kentucky bluegrasses that are better able to handle drought, disease and low maintenance, according to the director of the National Turfgrass Evaluation Program.

Kevin Morris was reporting on the final reports of the five-year test of bluegrasses and four-year test of ryegrasses.

Speaking from the U.S. Department of Agriculture's Beltsville (Md.) Agricultural Research Center, Morris said, "Tall fescues and ryegrasses came on in the 1980s. But I think there is a resurgence in the bluegrasses."

In the 1980s, he said, golf course superintendents and others started using tall fescues because they had no disease problems and were able to survive low-maintenance situations and drought.

"It fit a big market niche. But through breeding, we have moved tall fescues away from that. We tried to take the old tall fescue and make it darker green, denser and lower-growing. We have been able to do all that. We've moved it closer to Kentucky bluegrass, but it's not



Kentucky bluegrass. So we've moved it away from some of its more positive traits, and added some problems. It tends to be slower to establish and has a harder time getting through the first summer after establishment."

Morris said Europeans, who have worked with the bluegrasses a long time, are doing major breeding research.

"They are trying to open up their market and are looking at the United States more closely and more aggressively than in the past. They don't have the disease problems we have over here — on the East Coast, particularly. So generally their grasses don't have the disease resistance we need," he said.

"But they are working to improve that. In general, they've probably done a pretty good job."

Morris said European cultivars of bluegrass tend to have more wear tolerance.

"They use the bluegrasses, ryegrasses, fine fescues and chewings fescues a lot on their athletic fields. They seem to be more refined about breeding for those (wear) traits than we are here."

Morris added that U.S. universities are conducting a national test

Kentucky bluegrass national field test tabulations

Name	BC1	CA2	CA3	CA4	DC1	GA1	IA1	ID1	ID2	IL1	IL2	IN1	KS1	KS2	KY1	MB1	MD1	MI1	MN1	MO1	NC2	NC4	NE1	NE2	NE3	NJ1	NJ2	NM2	OH1	OK1	OR1	PA1	PA2	RI1	SD1	UB1	VA1	VA2	VA3	WA1	WA3	WA4	MEAN
*Blacksburg	6.3	4.5	5.1	6.3	2.4	5.8	4.9	7.2	7.3	6.5	7.2	6.7	7.2	8.0	6.4	8.3	6.8	6.4	4.3	6.5	4.0	6.3	6.0	5.4	5.8	7.1	7.1	6.0	6.0	5.2	7.3	6.1	7.8	7.4	7.2	7.9	5.6	5.9	4.7	7.3	6.4	5.6	**6.2**
*Midnight	5.7	4.3	5.6	6.7	3.9	5.7	4.3	7.8	7.4	6.2	6.0	6.9	7.3	8.4	5.9	7.6	7.1	6.9	3.0	6.3	3.7	6.1	6.2	6.0	5.7	7.2	6.8	7.3	6.5	5.7	7.0	4.6	5.8	6.8	7.3	7.7	5.6	5.4	5.4	6.9	6.7	3.4	**6.1**
*Princeton 104	6.2	3.1	4.8	5.8	2.6	5.3	4.7	7.2	6.8	6.6	6.0	6.5	6.7	8.1	5.6	7.2	6.9	7.2	5.0	6.4	4.3	6.2	5.4	5.6	5.4	7.0	6.7	5.5	6.0	5.3	6.7	5.4	-	6.9	6.5	7.3	5.8	5.1	4.6	7.2	7.8	4.9	**6.0**
*Asset	6.0	4.1	5.5	6.1	5.1	6.0	4.4	5.8	6.9	6.1	5.4	6.8	6.6	7.2	6.1	7.9	6.0	6.5	5.3	6.3	4.8	5.7	5.4	5.8	5.3	6.6	6.3	6.5	6.4	5.9	6.5	4.9	6.3	6.8	7.1	6.9	5.4	5.7	4.2	6.5	6.9	5.8	**5.9**
*Chateau	6.1	4.2	5.3	6.1	3.6	6.2	4.5	8.0	6.2	5.8	6.2	6.4	6.7	7.3	5.7	7.3	5.7	5.9	4.0	6.7	4.8	5.8	5.8	6.1	5.8	5.7	5.8	6.0	6.7	5.2	6.1	4.8	6.2	6.8	6.7	6.6	5.4	5.6	5.2	6.9	6.6	6.4	**5.9**
*Lofts 1757	5.8	3.1	5.2	6.8	3.7	5.8	5.3	7.3	6.7	6.1	5.9	6.5	6.9	7.8	5.7	7.2	6.5	6.5	3.7	6.5	3.8	5.9	5.1	4.9	4.8	6.6	6.5	7.0	5.7	6.2	6.3	5.0	5.6	6.8	6.7	7.2	5.7	5.4	4.7	6.5	6.6	5.2	**5.9**
*Coventry	6.3	5.4	5.2	5.9	3.8	6.0	4.3	7.5	6.4	5.7	6.7	5.7	6.8	7.0	5.7	7.1	6.0	5.9	4.7	6.6	3.8	5.3	5.4	6.0	5.7	5.6	5.2	6.7	6.3	5.5	5.9	5.2	5.3	6.3	6.7	6.6	5.6	5.3	5.5	6.3	6.9	5.9	**5.9**
*Freedom	x	N4.9	5.5	x	x	5.7	5.7	7.3	6.7	6.4	5.9	6.3	x	7.0	5.8	7.0	6.3	5.6	5.0	6.8	3.5	5.0	5.8	5.3	4.8	5.4	5.2	6.8	5.5	5.5	5.7	5.0	x	6.5	6.9	6.5	5.3	5.0	5.2	6.4	6.0	6.7	**5.8**
BA 73-540	6.3	5.0	5.3	6.0	4	6.0	4.6	7.0	6.7	6.0	6.2	5.5	6.4	7.2	5.7	7.5	6.3	6.0	2.7	6.3	4.7	5.5	5.6	6.0	6.1	5.7	5.5	6.3	6.5	6.5	6.0	4.4	6.1	6.7	6.7	6.8	5.1	5.6	4.6	6.9	6.5	4.5	**5.8**
*America	5.3	4.9	4.8	5.7	3.9	5.9	4.7	5.0	6.8	6.0	6.3	6.9	7.1	7.5	6.6	7.5	6.1	5.8	3.3	6.5	4.3	4.9	5.7	4.9	5.2	6.2	6.2	7.2	6.3	5.8	6.3	5.9	5.6	6.8	7.5	7.5	5.5	4.7	5.1	6.6	4.9	7.6	**5.8**
*Eclipse	5.8	4.0	4.6	5.9	3.3	5.6	4.8	7.7	7.1	6.3	5.9	6.6	6.8	7.6	6.2	7.6	6.2	6.7	2.3	6.2	3.5	6.3	5.8	5.8	5.5	6.5	6.4	6.3	5.9	6.1	6.6	4.9	6.5	7.2	7.3	7.5	5.7	5.2	4.7	6.7	4.4	4.9	**5.8**
*Aspen	5.5	5.3	5.1	5.9	3.5	5.4	4.6	7.2	6.2	6.8	6.1	6.6	7.0	7.3	6.3	7.5	6.2	6.1	3.0	6.4	4.0	6.4	5.1	5.5	5.3	6.3	6.1	6.5	5.3	5.2	5.7	5.8	6.8	6.6	7.3	7.3	5.1	5.3	5.4	6.3	5.7	4.7	**5.8**
*Estate	6.4	4.7	5.3	6.5	4.0	6.3	4.6	7.3	6.5	5.7	6.2	6.0	6.5	7.0	5.7	7.2	5.8	5.5	2.0	6.6	4.7	6.3	5.3	6.1	6.0	5.8	5.5	6.8	6.2	5.5	6.3	4.6	5.6	6.7	6.8	6.7	5.1	5.2	5.2	6.4	6.9	4.0	**5.8**
*Glade	5.9	5.6	5.3	6.3	4.8	5.4	4.4	6.2	7.0	5.2	5.7	6.3	6.6	7.4	5.9	7.8	6.0	6.0	3.3	6.4	3.8	7.2	6.0	5.8	6.1	6.2	5.9	6.3	6.1	4.7	5.5	5.1	6.5	6.7	6.9	6.9	5.1	5.3	4.6	6.5	5.5	4.8	**5.8**
*Classic	5.6	5.8	5.5	6.3	3.7	5.7	5.0	6.8	6.6	6.2	5.8	6.4	6.7	6.9	6.2	7.5	6.3	5.9	4.7	6.6	3.5	4.9	5.2	5.5	4.8	5.6	5.4	7.3	5.4	5.7	6.0	4.6	5.5	6.2	7.2	6.4	5.4	4.9	5.3	6.1	6.4	5.9	**5.8**
WW AG 496	5.7	3.5	5.3	5.6	4.2	5.4	5.0	7.3	6.4	6.5	6.5	6.2	x	7.3	5.8	8.2	6.6	5.2	4.0	6.4	4.8	5.8	6.2	5.5	5.3	5.6	5.7	7.5	5.9	5.2	5.6	5.1	6.1	6.6	7.0	6.7	5.3	5.5	4.5	6.1	6.3	4.1	**5.8**
* Able 1	5.4	3.7	4.8	6.8	3.2	5.9	5.2	7.3	6.8	6.5	5.8	6.7	7.1	6.8	6.0	7.7	6.1	6.1	3.7	6.2	4.2	6.0	5.1	5.6	5.2	6.4	6.2	6.8	5.5	4.9	6.3	5.1	7.3	6.9	7.0	6.9	5.0	5.0	4.4	6.6	6.4	5.9	**5.8**
*Wabash	4.9	4.8	5.2	5.4	5.6	5.6	5.7	7.0	6.2	6.8	7.0	6.8	6.4	6.5	6.2	7.7	6.0	5.6	5.3	6.6	4.5	5.5	5.5	6.0	6.2	4.9	4.9	6.3	5.8	5.7	4.9	6.0	4.3	6.8	7.3	6.6	5.1	5.3	4.9	5.9	4.4	5.8	**5.8**
*A-34	6.1	4.3	5.3	6.1	4.8	5.6	5.1	6.7	6.9	6.5	5.9	6.5	6.4	7.1	5.8	7.5	6.7	5.1	3.7	6.6	3.5	5.7	6.2	5.9	5.8	5.4	5.0	6.5	5.9	6.2	6.0	5.1	6.3	7.1	5.9	6.4	5.2	5.0	4.7	6.2	6.4	5.8	**5.8**
BA 69-82	6.0	3.6	5.4	5.9	4.4	6.2	4.5	7.8	6.5	6.4	6.0	5.8	6.6	7.1	5.9	7.3	5.3	5.9	2.7	6.5	4.7	5.8	5.1	5.4	5.3	5.3	5.2	6.7	6.5	5.9	5.9	4.0	5.9	6.5	7.0	6.7	5.4	5.3	4.8	6.4	6.6	5.9	**5.8**
BAR VB 534	5.5	4.2	5.3	4.9	3.6	6.3	4.8	6.5	6.5	5.9	5.6	6.8	x	6.8	5.5	8.2	6.5	5.1	5.3	6.2	4.0	5.6	6.4	5.7	6.3	5.6	5.5	6.5	5.7	5.9	5.3	5.3	6.3	7.0	7.4	6.7	5.1	4.6	4.3	5.4	5.7	6.2	5.8
*Cheri	6.2	4.7	5.4	5.9	3.4	6.0	4.1	7.7	6.7	6.0	5.9	5.9	6.9	7.2	5.8	7.7	5.8	5.8	2.7	6.5	5.2	6.2	5.7	6.0	5.3	5.6	5.5	6.2	6.1	5.2	5.9	4.3	5.6	6.6	6.5	6.7	5.3	4.9	4.9	6.7	6.0	7.1	**5.8**
*Bristol	5.7	4.5	5.3	6.5	3.4	5.4	4.5	7.5	6.3	5.7	5.9	6.3	6.8	7.5	6.0	7.0	6.2	6.4	3.3	6.5	3.7	5.2	5.7	5.0	5.0	6.5	6.2	5.7	6.0	5.9	6.5	5.1	5.8	6.6	7.0	6.8	5.1	5.0	4.6	6.4	6.8	5.9	**5.8**

Bluegrass test sites

The site descriptions and management practices for the 1986-90 National Kentucky Bluegrass Test follow, with location listed first, then soil texture; nitrogen (pounds per 1,000 square feet); mowing height in inches; and irrigation practiced:

BC1: Agassiz, British Columbia; loam; 2.1-3.0; 1.1-1.5; only during severe stress.

CA2: Santa Ana, Calif; N/A.

CA3: Riverside, Calif.; sandy loam; 2.1-3.0; 1.6-2.0; to prevent stress.

CA4: Ventura, Calif.; silty clay loam; 8.1+; 1.1-1.5; to prevent stress.

DC1: Washington Monument Grounds; loam; 1.1-2.0; 2.1-2.5; no irrigation.

GA1: Experiment, Ga.; sandy clay loam; 3.1-4.0; 2.1-2.5; to prevent stress.

IA1: Ames, Iowa; silty clay loam; 3.1-4.0; 1.6-2.0; no irrigation.

ID1: Moscow, Idaho; silty clay loam; N.A.

ID2: Post Falls, Idaho; sandy loam; 2.1-3.0; 1.6-2.0; to prevent stress.

IL1: Urbana, Ill.; silty clay and clay; 3.1-4.0; 1.6-2.0; to prevent stress.

IL2: Carbondale, Ill.; silty clay and clay; 0.0-1.0; 2.1-2.5; only during severe stress.

IN1: West Lafayette, Ind.; silt loam and silt; 3.1-4.0; 2.1-2.5; to prevent stress.

KS1: Manhattan, Kan.; sandy clay loam; 3.1-4.0; 2.6-3.0; to prevent stress.

KS2: Wichita, Kan.; sandy loam; 3.1-4.0; 2.1-2.5; to prevent stress.

KY1: Lexington, Ky.; silt loam and silt; 2.1-3.0; 1.6-2.0; only during severe stress.

MB1: Winnipeg, Manitoba, Canada; silty clay and clay; 2.1-3.0; 0.6-1.0; to prevent stress.

UB1: Beltsville, Md.; silt loam and silt; 2.1-3.0; 1.1-1.5; to prevent dormancy.

MD1: Silver Spring, Md; sandy loam; 3.1-4.0; 2.1-2.5; to prevent dormancy.

MI1: East Lansing, Mich.; sandy loam; 2.1-3.0; 1.6-2.0; to prevent stress.

MN1: St. Paul, Minn.; silty clay loam; 3.1-4.0; 1.6-2.0; to prevent stress.

MO1: Columbia, Mo.;silty loam and silt; 3.1-4.0; 2.1-2.5; to prevent stress.

NC2: Charlotte, N.C.; silty clay loam; 2.1-3.0; 1.1-1.5; only during severe stress.

NC4: Goldsboro, N.C.; sandy loam; 2.1-3.0; 1.1-1.5; only during severe stress.

NE1: Lincoln, Neb.; silty clay loam; 3.1-4.0; 1.6-2.0; to prevent stress.

NE2: Lincoln, Neb.; silty clay loam; 3.1-4.0; 2.1-2.5; to prevent stress.

NE3: Mead, Neb.; silty clay loam; 3.1-4.0; 0.6-1.0; to prevent stress.

NJ1: North Brunswick, N.J.; sandy loam; 4.1-5.0; 1.6-2.0; to prevent dormancy.

NJ2: Adelphia, N.J.; sandy loam; 5.1-6.0; 1.6-2.0; to prevent dormancy.

NM2: Farmington, N.M.; loamy sand; 2.1-3.0; 2.6-3.0; to prevent stress.

OH1: Columbus, Ohio; silty clay loam; 1.1-2.0; 2.1-2.5; to prevent stress.

OK1: Stillwater, Okla.; N/A.

OR1: Hubbard, Ore.; silt loam and silt; 4.1-5.0; 1.1-1.5; to prevent dormancy.

PA1: University Park, Pa.; silty clay silt; 2.1-3.0; 0.0-0.5; to prevent stress.

PA2: University Park, Pa.; silt loam and silt; 2.1-3.0; 1.1-1.5; to prevent stress.

RI1: Kingston, R.I.; silt loam and silt; 3.1-4.0; 1.1-1.5; to prevent stress.

SD1: Brookings, S.D.; silty clay loam; N/A; 2.1-2.5; to prevent stress.

VA1: Blacksburg, Va.; sandy loam; 2.1-3.0; 1.6-2.0; to prevent dormancy.

VA2: Blackstone, Va.; sandy loam; 2.1-3.0; 1.1-1.5; only during severe stress.

VA3: Remington, Va.; loam; 2.1-3.0; 2.1-2.5; only during severe stress.

WA1: Pullman, Wash.; silt loam and silt; 2.1-3.0; 1.6-2.0; to prevent stress.

WA3: Puyallup, Wash.; sandy loam; 3.1-4.0; 1.1-1.5; to prevent stress.

WA4: Ritzville, Wash. (dense shade); silt loam and silt; 0.0-1.0; 2.1-2.5; only during severe stress.

while ryegrass improvements continue

for bluegrasses under low-maintenance situations in more than two dozen locations. "A lot of the bluegrasses look pretty good under these situations — in how quickly they establish and their looks," he reported.

'The progress made over the past four or five years — in color, density, lower-growing growth habit — is amazing.'
— Kevin Morris

RYEGRASS IMPROVEMENTS

Extraordinary advances are being made yearly in ryegrass breeding, Morris said.

"If you take the top cultivars in this (completed) test and compare them with the current test (planted in 1990), you will find there will probably be 30 new varieties or so that are better .

"The progress made over the past four or five years — in color, density, lower-growing growth habit — is amazing."

Morris said the supply of new varieties is probably limited. "But you need to watch pretty closely because there will be a lot of varieties coming out on the market that are better than what's available now.

"I'm not sure yet if we've improved the stress and disease tolerance, but we've improved the appearance of them a lot."

TESTS A STARTING POINT

Morris called the four- and five-year test results "a starting point ... a guideline" for superintendents on the lookout for a purchase.

"Within the 'mean' figure (for each cultivar in the test), there is a varying amount of data," he said. "Some locations collected a lot more data than others. One location might be able to collect data all year around, while another can only do it four months. It can be a little misleading but, in general, one location doesn't significantly impact the mean.

"You're trying to determine if there are some cultivars that really won't grow in an area, or that really stand out. Usually you have a group in the middle that are hard to separate out."

New cultivars of bluegrasses and ryegrasses were planted in 1990, and the first results from those plots will be made available this spring, Morris said.

In those tests, one-third to one-half of the cultivars were included in the last tests as well. The rest are new varieties.

Ryegrass national field test tabulations

Name	BC1	DC1	ID2	IL1	IL2	IN1	KS1	KS2	KY1	MA1	MD1	MI1	MO1	NE1	NJ1	NJ2	NM1	NY1	NY2	OH2	OK1	OR1	OR1	OR2	PA1	PA2	RI1	SD1	UB1	VA1	VA7	WA3	MEAN
*Saturn	5.6	4.8	6.7	6.6	7.3	6.7	7.0	7.6	6.3	5.0	6.0	6.2	6.8	6.3	6.1	6.5	7.3	5.1	6.1	6.9	4.9	6.8	6.8	6.3	6.8	6.9	6.8	6.3	6.9	4.4	3.3	7.8	6.3
*SR 4000	5.4	3.5	6.4	6.2	7.1	6.5	6.9	7.0	6.1	5.0	6.4	6.0	6.6	6.0	6.8	6.6	7.5	5.5	5.9	6.8	5.0	6.2	6.2	6.4	6.4	6.4	6.6	6.8	6.9	4.8	3.1	8.2	6.2
*SR 4100	5.4	3.7	6.4	6.4	7.7	6.6	7.0	7.1	6.1	5.3	6.3	5.7	6.9	5.7	6.5	6.0	7.1	5.4	6.1	6.5	4.9	6.3	6.3	6.3	6.6	6.9	6.5	6.4	7.0	4.7	2.8	7.9	6.1
*Dimension	5.5	3.8	6.7	6.4	6.7	6.4	7.0	7.4	6.1	5.3	5.5	6.2	6.4	6.0	6.2	6.8	7.4	5.0	5.6	6.6	5.1	6.9	6.9	6.5	6.6	6.6	6.5	6.6	6.5	4.4	3.5	8.0	6.1
*PST-M2E	5.7	4.6	6.1	6.2	6.8	6.8	7.1	7.4	5.9	4.8	5.9	5.7	6.6	5.6	6.2	6.4	7.4	4.9	6.3	6.9	5.1	6.9	6.9	6.5	6.7	6.3	6.6	6.5	6.8	4.4	3.2	7.2	6.1
*Pennant	5.8	4.5	6.4	6.3	7.4	6.5	6.6	7.2	6.0	5.1	6.2	5.7	6.6	5.9	6.0	6.0	7.3	5.3	5.8	6.5	5.2	5.8	5.8	6.0	6.4	6.7	6.7	6.4	6.4	4.8	3.8	8.1	6.1
*Commander	5.5	5.0	6.0	6.3	7.2	6.6	6.8	7.1	6.3	5.0	5.8	5.4	6.4	5.9	5.8	6.4	7.2	5.3	6.1	6.6	4.3	6.4	6.4	6.4	6.9	6.5	6.4	6.8	6.5	4.7	3.2	7.9	6.1
*Fiesta 11	5.5	3.8	6.5	6.4	6.8	6.7	7.0	6.9	6.0	5.3	5.5	5.4	6.5	6.2	5.9	6.3	7.4	5.3	6.1	7.1	5.1	6.3	6.3	6.4	5.6	6.4	6.6	7.1	5.8	4.7	3.6	8.3	6.1
*Repell	5.9	5.4	6.0	5.9	7.1	6.6	6.8	6.7	6.3	5.0	6.0	5.7	6.2	5.9	5.6	5.8	7.3	5.1	6.3	6.9	4.6	6.0	6.0	6.3	6.2	6.7	6.8	6.7	6.8	4.3	3.3	7.6	6.1
*Riviera	5.9	3.8	6.3	6.4	7.4	6.4	6.8	7.3	6.2	5.0	5.6	5.8	6.6	5.9	6.2	6.2	7.2	5.2	6.0	6.9	4.5	6.2	6.2	6.3	5.9	6.6	6.7	6.9	6.0	4.6	2.9	7.7	6.0
* Palmer	6.0	6.0	6.4	6.5	6.9	6.6	6.7	6.9	5.8	5.0	6.1	5.6	6.2	5.7	5.6	5.8	7.4	4.8	5.8	6.6	3.9	6.2	6.2	6.1	5.9	6.7	6.4	6.5	6.0	4.9	3.9	8.0	6.0
*Blazer 11	5.6	5.1	6.8	6.2	6.8	6.6	7.2	6.5	6.0	5.3	5.5	5.8	6.5	6.1	6.1	6.5	7.0	5.1	6.0	7.1	4.4	6.5	6.5	6.4	5.6	5.9	6.0	6.7	5.2	4.5	3.1	8.0	6.0
*Omega 11	5.7	2.6	6.6	6.2	6.3	6.4	6.9	7.2	6.2	4.9	5.7	5.5	6.4	5.9	5.7	6.0	7.5	5.1	5.7	6.8	5.1	6.9	6.9	6.2	5.9	6.3	6.4	6.6	6.5	4.5	3.4	8.3	6.0
*Charger	5.4	3.5	6.6	6.2	7.4	6.6	6.9	7.5	5.8	4.9	6.2	5.9	6.4	5.8	5.4	6.4	7.1	5.0	5.8	6.5	4.1	6.6	6.6	6.3	5.7	6.1	6.4	6.9	6.2	4.7	3.2	8.1	6.0
*Competitor	5.4	4.6	5.9	5.8	6.7	6.4	6.8	7.1	5.8	5.3	5.4	5.4	6.4	5.9	5.9	6.3	7.3	5.0	6.1	6.8	4.5	6.6	6.6	6.5	6.4	5.9	6.1	6.9	6.2	4.4	2.7	8.5	6.0
*Manhattan 11	5.8	4.3	6.3	6.3	6.6	6.4	6.7	7.3	5.6	4.8	5.8	5.8	5.9	5.8	5.6	6.1	7.3	4.9	5.9	6.9	4.5	6.5	6.5	6.5	5.9	6.2	6.2	6.4	6.1	4.7	3.1	8.1	6.0
*Dasher 11	5.5	2.9	5.9	5.8	6.5	6.5	7.0	7.4	6.1	4.9	5.8	5.6	6.5	"5,8"	6.2	6.1	7.2	5.2	5.7	6.6	4.8	6.2	6.2	6.4	6.2	6.5	6.6	6.5	6.5	4.7	2.8	7.2	5.9
*Edge	5.5	3.3	6.0	6.2	6.2	6.5	6.8	7.0	6.0	5.0	6.3	5.3	6.7	5.7	6.4	6.1	7.0	5.0	5.8	6.7	4.3	6.1	6.1	6.0	6.2	6.2	6.2	6.6	6.8	4.5	2.9	8.1	5.9
PST-2DD	5.5	3.1	7.1	5.6	6.9	6.4	6.7	6.2	5.8	4.9	5.1	5.4	5.5	6.1	5.5	6.4	7.4	5.0	x	6.9	5.2	7.1	7.1	6.5	x	6.6	6.3	6.9	6.5	4.1	3.0	7.7	5.9
*Citation 11	5.8	2.2	5.8	6.2	6.9	6.4	6.8	7.3	6.1	5.0	6.3	5.6	6.4	5.5	5.5	6.1	7.5	4.8	5.6	6.3	'5.5	6.4	6.4	6.2	5.7	6.2	6.3	6.4	6.8	4.5	2.9	7.8	5.9
*Prelude	5.7	5.1	6.1	6.0	6.9	6.4	6.8	7.3	5.6	5.1	6.1	5.4	6.1	5.5	5.4	5.7	7.1	4.7	6.2	6.5	4.3	6.1	6.1	6.1	5.7	6.4	6.5	6.7	5.6	4.6	3.5	7.7	5.9
*Allaire	5.6	4.9	6.1	6.0	6.3	6.5	7.0	6.5	5.7	4.9	5.9	5.8	6.1	6.0	5.7	6.4	7.1	5.0	5.9	6.5	5.3	6.0	6.0	6.3	6.2	5.8	6.1	6.3	5.3	4.0	3.2	8.2	5.9
*Gator	5.6	4.9	6.1	6.1	6.2	6.4	6.8	6.7	5.9	4.9	5.6	5.4	6.1	5.9	5.4	5.9	7.4	5.0	5.8	6.8	4.5	6.0	6.0	6.3	6.0	6.4	6.5	6.6	5.1	4.8	3.2	8.1	5.9
*Lindsay	5.7	4.1	6.1	5.9	6.6	6.3	6.8	6.8	5.7	5.0	6.0	5.7	6.0	5.9	5.3	5.8	7.0	5.0	5.6	6.6	5.1	6.0	6.0	6.4	5.9	6.1	6.4	6.8	5.6	4.8	3.3	7.6	5.9
*Aquarius	5.4	2.8	6.9	5.5	6.1	6.2	7.2	6.7	5.3	5.0	5.1	5.5	6.0	5.8	6.3	6.5	7.2	4.6	6.3	7.0	5.0	6.5	6.5	6.7	5.8	5.9	6.0	7.3	5.4	4.0	2.9	8.3	5.8
*Tara	5.8	3.6	6.6	6.2	6.7	6.4	6.9	6.6	5.9	5.0	5.8	5.7	5.8	5.7	5.4	6.0	7.0	4.8	5.9	7.0	4.3	6.5	6.5	6.4	5.6	6.2	6.5	6.6	4.9	4.3	3.3	7.7	5.8
*Goalie	5.6	4.5	6.3	5.9	7.6	6.4	6.7	7.0	5.7	5.1	6.2	5.4	6.3	5.3	5.4	5.3	7.1	4.8	5.9	6.5	4.3	5.3	5.3	5.7	5.8	5.9	6.5	6.8	5.7	4.8	3.4	7.3	5.8
PSU-333	5.6	4.7	5.8	5.8	7.2	6.5	6.7	6.9	5.7	5.2	5.8	5.5	5.9	5.8	5.0	5.5	7.3	5.1	5.6	6.6	4.7	5.4	5.4	6.0	6.2	6.1	6.5	6.5	5.4	4.5	3.1	7.3	5.8
*Patriot	5.6	4.2	5.8	5.8	7.0	6.3	6.6	7.4	5.6	4.9	5.2	5.1	6.4	5.9	5.2	5.4	7.4	5.0	6.2	6.8	4.7	5.6	5.6	6.2	6.2	5.8	6.5	6.7	5.5	4.5	3.1	7.0	5.8
*Rodeo	6.0	4.5	6.5	5.8	6.1	6.4	6.8	6.1	5.5	5.1	5.1	5.5	6.0	5.9	5.7	5.7	7.0	4.8	5.9	6.6	5.0	5.9	5.9	6.2	6.2	6.3	6.3	6.3	4.8	3.9	3.1	7.9	5.8
*Birdie II	5.4	3.9	6.0	6.1	7.0	6.3	6.6	7.0	5.8	4.9	6.0	5.3	6.3	5.7	4.7	5.2	7.5	4.9	5.7	6.1	4.3	6.1	6.1	6.1	5.9	6.4	6.3	6.1	6.4	4.6	2.6	7.6	5.8

** — Varieties available in the marketplace.*

Descriptions of sites for ryegrass tests

The site descriptions and management practices for the 1987-90 National Perennial Ryegrass Test follow, with location listed first, then soil texture; nitrogen (pounds per 1,000 square feet); mowing height in inches; and irrigation practiced:

BC1: Agassiz, British Columbia; loam; 2.1-3.0; 1.6-2.0; only during severe stress.

DC1: Washington Monument Grounds; loam; 1.1-2.0; 2.1-2.5; no irrigation.

ID2: Post Falls, Idaho; silt loam and silt; 2.1-3.0; 1.1-1.5; to prevent stress.

IL1: Urbana, Ill.; silt loam and silt; 3.1-4.0; 2.1-2.5; to prevent stress.

IL2: Carbondale, Ill.; silty clay and clay; 4.1-5.0; 2.1-2.5; to prevent stress.

IN1: West Lafayette, Ind.; silt loam and silt; 3.1-4.0; 2.1-2.5; to prevent stress.

KS1: Manhattan, Kan.; silty clay loam; 3.1-4.0; 2.6-3.0; to prevent stress.

KS2: Wichita, Kan.; sandy loam; 3.1-4.0; 2.1-2.5; to prevent stress.

KY1: Lexington, Ky.; silt loam and silt; 2.1-3.0; 1.6-2.0; only during severe stress.

UB1: Beltsville, Md.; silt loam and silt; 2.1-3.0; 1.1-1.5; to prevent stress.

MA1: Amherst, Mass.; silt loam and silt; 2.1-3.0; 1.6-2.0; to prevent stress.

MD1: Silver Spring, Md; sandy loam; 3.1-4.0; 2.1-2.5; to prevent stress.

MI1: East Lansing, Mich.; sandy loam; 2.1-3.0; 1.6-2.0; to prevent stress.

MO1: Columbia, Mo.; sandy clay loam; 3.1-4.0; 2.1-2.5; to prevent stress.

NE1: Lincoln, Neb.; silty clay loam; 3.1-4.0; 1.6-2.0; to prevent stress.

NJ1: North Brunswick, N.J.; loam; 4.1-5.0; 1.1-1.5; to prevent stress.

NJ2: Adelphia, N.J.; sandy loam; 5.1-6.0; 1.6-2.0; to prevent dormancy.

NM1: Los Lunas, N.M.; sandy clay loam; 2.1-3.0; 1.6-2.0; to prevent stress.

NY1: Ithaca, N.Y.; sandy loam; 2.1-3.0; 1.1-1.5; to prevent stress.

NY2: Riverhead, L.I.; sandy loam; 2.1-3.0; 1.1-1.5; to prevent stress.

OH2: Marysville, Ohio; silty clay and clay; 3.1-4.0; 1.6-2.0; only during severe stress.

OK1: Stillwater, Okla.; N/A.

OR1: Hubbard, Ore.; silt loam and silt; 4.1-5.0; 1.1-1.5; to prevent stress.

OR2: Corvallis, Ore.; sandy clay loam; N/A; 2.1-2.5; to prevent stress.

PA1: University Park, Pa.; silt loam and silt; 2.1-3.0; 0.0-0.5; to prevent stress.

PA2: University Park, Pa.; silt loam and silt; 2.1-3.0; 1.1-1.5; to prevent stress.

RI1: Kingston, R.I.; silt loam and silt; 3.1-4.0; 1.1-1.5; to prevent stress.

SD1: Brookings, S.D.; silty clay loam; N/A; 2.1-2.5; to prevent stress.

VA1: Blacksburg, Va.; loam; 3.1-4.0; 1.6-2.0; only during severe stress.

VA7: Lynchburg, Va.; sandy loam; 2.1-3.0; 2.1-2.5; no irrigation.

WA3: Puyallup, Wash.; sandy loam; 4.1-5.0; 0.0-0.5; to prevent stress.