PRODUCT FEATURE

Scrutinizing ryegrasses

Major strides continue to be made in breeding research

By MARK LESLIE

Ryegrass breeding has progressed with such fervor in the last nine years that researchers may have reached perfection in some areas, according to an eminent ryegrass expert.

Dr. Reed Funk of Rutgers University said: "Up until the present, every time we made a variety lower, darker, finer, denser, or better mowing, it was an improvement. But I think we're at the point right now that it's questionable whether we want them any darker than the darker varieties that are coming out. It's a question whether we want them any finer.

"We have plateaued in some characteristics."

Funk said tough challenges do lie ahead

for ryegrass breeders in areas where "limited progress" has been made — such as in resistance to crown rust, red thread and dollar spot diseases.

"We need new sources of germplasm. We need better straining techniques," he said.

Plant breeding has been on a rocket ship Continued on page 26

man Sandresso scan n	HAM LERDER		Sarak.	ANDER IN	CT Hardin	The Property of							1.1.1									
Name	CO1	DC1	IA1	ID2	ID3	IL1	IL2	KS2	KY1	NJ1	NJ2	NJ3	OH1	ON1	OR7	OR9	RI1	UB1	VAIN	NA1	WA3 I	Mean
* Affinity (Gen-90)	7.2	3.5	5.9	6.5	6.6	8.7	7.2	8.0	5.8	6.9	7.2	6.3	7.4	6.4	5.9	6.6	4.0	7.6	4.6	7.2	6.6	6.5
* Brightstar	7.8	3.4	6.5	7.4	6.8	7.0	6.5	7.7	6.0	7.8	7.9	6.0	6.7	6.4	5.3	6.5	3.1	8.1	4.8	7.3	6,4	6.5
ZPS-28D	7.8	3.4	5.7	7.4	5.3	8.3	7.1	8.7	6.6	7.3	7.3	6.0	6.6	6.0	5.3	6.6	4.2	7.4	4.9	6.4	6.1	6.4
Pick 89-4	8.2	3.8	6.5	6.9	5.9	8.0	7.8	8.7	6.6	6.9	6.4	6.5	5.8	6.2	4.9	6.3	3.5	7.5	4.5	7.3	6.0	6.4
*Prelude II (2P2-90)	8.2	3.2	6.1	6.7	6.4	7.3	6.3	8.3	5.3	6.8	7.5	6.1	6.9	6.2	5.1	6.4	4.6	7.8	4.1	8.1	6.5	6.4
*APM	8.2	3.7	5.7	6.3	6.3	7.3	6.7	9.0	6.1	6.9	6.9	5.3	6.8	6.3	5.2	6.4	5.0	7.5	4.5	7.6	6.0	6.4
*Yorktown III (LDRF)	8.0	3.0	5.8	6.5	5.9	8.0	6.4	8.3	6.6	6.8	6.7	5.8	6.6	6.3	5.5	6.3	4.5	7.5	4.4	8.3	6.3	6.4
*Assure	8.2	3.4	5.7	7.1	6.6	8.0	6.9	8.3	6.2	6.7	6.3	6.1	6.8	6.2	4.5	6.3	4.7	7.3	4.0	7.9	6.4	6.4
Pick DKM	7.0	3.4	6.3	7.1	6.1	7.7	7.2	7.7	7.3	6.8	7.0	6.3	6.8	6.2	5.3	6.2	3.6	7.3	4.3	7.6	6.3	6.4
*Eagle (WVPB-89PRA3)	8.0	3.6	6.2	6.9	6.6	7.7	6.1	8.3	6.2	6.4	6.3	6.1	6.7	6.2	5.3	6.0	4.5	7.3	4.1	8.0	6.3	6.3
PS-105	7.7	3.6	6.1	6.8	6.5	7.7	6.0	7.7	6.5	7.3	7.0	5.7	6.9	6.2	4.7	6.2	4.1	7.3	4.3	8.0	6.5	6.3
*Pinnacle	8.7	3.3	6.0	6.5	6.5	8.7	6.7	8.3	6.1	6.9	6.3	5.5	7.0	6.3	4.3	6.3	4.7	7.0	4.2	7.0	6.3	6.3
*Advent	8.3	3.6	5.9	6.1	6.2	8.3	6.6	8.0	5.7	6.9	6.4	5.1	6.8	6.0	5.2	6.2	4.3	7.3	4.9	8.0	6.4	6.3
*4DD-Delaware Dwarf	8.0	4.1	6.3	6.8	6.7	8.0	6.9	8.7	7.0	6.2	5.8	4.9	6.9	6.3	4.6	5.9	4.1	7.0	4.2	7.3	6.1	6.3
PST-28M	7.5	3.2	6.3	5.9	5.8	8.0	7.3	8.7	6.2	6.6	7.1	5.7	6.8	6.0	4.8	6.6	3.9	7.6	4.6	6.7	6.4	6.3
*Quickstart (PST-2FQR)	8.2	2.8	6.1	6.5	6.3	8.0	6.8	8.3	5.5	6.8	7.1	6.0	6.2	6.6	4.6	6.4	4.3	7.2	4.2	7.0	6.7	6.3
89-666	7.7	3.8	5.9	7.3	6.5	8.0	6.9	8.0	6.8	6.5	6.0	5.2	6.6	6.1	4.4	5.9	4.4	7.0	4.3	7.4	6.6	6.3
*Repell II (LDRD)	7.8	37	5.2	6.3	6.0	8.0	6.1	8.3	6.5	6.9	7.3	6.2	6.1	6.2	4.8	6.3	4.0	7.8	4.5	6.9	6.0	6.2
PST-290	7.2	3.9	. 5.2	6.3	6.9	8.0	6.2	8.3	6.3	6.8	6.9	5.3	6.3	6.5	418	6.5	4.0	7.2	4.3	8.2	5.9	6.2
*SR 4200	8.2	2.9	5.7	5.8	6.1	8.3	6.2	8.3	6.1	7.2	6.8	5.7	6.6	6.4	5.5	6.3	3.7	7.7	4.1	6.8	6.5	6.2
*Palmer II (P89)	7.8	3.4	5.5	5.3	6.1	7.0	6.8	8.3	6.5	6.9	7.8	6.2	6.0	6.1	5.0	6.3	3.8	7.8	4.3	7.7	5.9	6.2
Pick 9100	7.0	3.3	5.1	7.5	6.8	7.0	6.6	9.0	6.4	6.3	7.0	5.8	5.8	6.3	4.8	6.5	3.7	7.5	4.3	7.7	5.9	6.2
Legacy	7.8	3.8	5.8	5.3	6.7	8.3	6.3	8.3	6.6	6.7	7.0	5.9	5.8	6.2	5.1	6.5	3.5	6.9	4.0	7.3	6.3	6.2
SYN-P	8.2	3.6	5.8	5.7	6.1	7.3	6.9	8.0	6.3	7.1	7.0	5.8	6.2	6.8	4.3	6.1	4.0	7.0	4.4	6.9	6.3	6.2
PST-2FF	7.5	3.5	5.7	6.3	5.7	x	6.8	8.7	6.5	7.3	6.9	5.8	6.6	6.1	4.6	6.8	3.7	7.5	4.3	7.2	6.4	6.2
*Seville	7.7	3.9	5.1	6.6	6.1	8.3	6.0	8.3	5.9	6.3	6.6	5.3	7.1	6.4	4.5	6.3	3.9	6.8	4.1	7.9	6.4	6.2
Pick 1800	8.0	3.8	5.8	6.1	5.7	7.3	7.5	8.3	6.7	6.5	6.1	5.8	6.4	5.9	4.8	6.1	4.0	7.4	4.5	6.8	5.7	6.2
*Dandy	7.8	3.7	5.7	6.5	6.3	7.7	6.7	7.3	6.3	6.0	6.0	5.1	7.2	6.3	4.8	6.3	4.2	6.8	4.3	7.6	6.2	6.1
Pick 89LLG	8.2	3.1	6.6	7.6	6.3	x	5.8	8.0	4.3	5.5	5.7	5.8	6.3	6.3	6.0	6.3	4.0	7.2	4.9	7.9	6.5	6.1
*Navaio' (PST-2DPR)	8.0	3.8	6.0	6.7	6.9	7.7	5.7	8.7	58	5.7	6.2	5.4	5.8	6.3	5.3	5.9	3.9	7.0	4.2	7.0	6.2	6.1
Pick EEC	7.7	3.4	5.3	7.1	5.7	6.3	6.5	7.3	5.9	7.0	6.9	5.7	5.7	6.1	4.9	6.5	4.1	7.7	4.4	7.7	6.1	6.1
MOM LP 3147	7.5	3.2	5.7	6.5	6.0	9.0	6.8	7.0	6.1	6.8	5.9	5.3	6.8	6.1	4.9	6.3	3.8	6.8	4.2	7.1	6.2	6.1
PST-2B3	8.0	3.3	5.9	5.8	7.2	7.3	6.1	8.0	5.5	6.3	5.7	5.5	6.5	6.4	5.0	6.2	4.3	6.9	4.4	7.0	6.4	6.1
LSD Value	1.0	1.1	0.9	1.5	1.1	1.6	0.8	0.9	0.8	0.8	0.9	0.8	0.8	0.6	0.9	0.4	0.7	0.7	0.7	1.5	0.8	0.2

Turfgrass tests very useful — if you use them correctly

By KEVIN N. MORRIS

The National Turfgrass Evaluation Program (NTEP) was initiated in 1980 to coordinate uniform evaluation trials of turfgrass varieties and promising selections in the United States and Canada. Tests are conducted at universities and some private institutions with most states evaluating at least one NTEP test.

Since its inception, the NTEP has collected information on more than 50 turfgrass characteristics from approximately 800 experimental and commercial cultivars encompassing 17 turfgrass species.

Annual progress reports containing data collected the previous year are released for each species tested. A final report containing all data collected is produced at the end of the testing period. These progress reports are available to anyone who requests them.

The number of experimental and commercial cultivars in NTEP tests has increased greatly the last few years — with 123 entries in the current national perennial ryegrass test — making decisions about varieties more difficult for consumers. Therefore, to use NTEP information most effectively, it is important to know how to correctly interpret the NTEP progress reports.

The first step in this interpretation process is to look at Table A - "Locations, Site Descriptions and Management Practices." This table gives information on soil type and pH, GOLF COURSE NEWS levels of soil phosphorus and potassium, whether the test was conducted in sun or shade, the amount of nitrogen and irrigation applied and the mowing height.

Make sure the tests that you are scrutinizing are managed in a similar manner as your site. Data from a Kentucky bluegrass test mowed at one inch and irrigated to prevent any stress would be of little value to you if your site is a non-irrigated home lawn.

Table B—"Locations and Data Collected" — summarizes the data that each location collected. This is especially helpful for monthly quality data as some locations may collect data from only one or two months within a year. In this case, the data presented for that location is not very representative of a cultivar's performance for an entire growing season.

Turfgrass quality ratings are collected monthly and are an overall visual evaluation of each grass. Quality ratings encompass all the factors that affect the quality of a turf stand including genetic color, density, percent ground cover, disease and insect injury, heat and drought tolerance and uniformity.

Past research has found that most researchers evaluating NTEP tests emphasize color and density when rating turfgrass quality.

Turfgrass quality is contained in three tables in all NTEP progress reports. One table displays data from each test location

lea	dina	rved	rasse	es in	den	etic o	color		
LOO	anig	./ •9			9011	one .	coror		
Name	ID2	ID3	KS2	NJ1	NJ3	OH1	OR9	WA3	Mean
Brightstar	8.0	7.7	8.7	9.0	6.7	8.0	7.0	7.7	7.8
Palmer II	7.3	8.0	9.0	9.0	7.0	8.0	7.3	5.7	7.7
Pick 89-4	7.7	7.3	8.7	9.0	6.7	7.7	7.3	7.0	7.7
Pick 9100	7.7	7.7	9.0	8.0	6.0	7.7	7.0	7.0	7.5
Pick DKM	7.7	8.0	8.0	8.3	6.0	8.0	7.0	7.0	7.5
PST-2FF	7.3	8.0	9.0	8.3	6.0	7.3	7.0	7.0	7.5
Gettysburg	7.0	7.7	8.7	8.0	6.7	8.0	6.7	7.0	7.5
Pick EEC	7.3	8.0	8.7	8.3	5.7	7.7	7.0	7.0	7.5
ZPS-28D	8.0	7.7	8.3	8.0	6.0	7.3	7.0	7.0	7.4
Pick 89LLG	7.7	7.7	8.0	8.0	6.0	7.7	7.0	7.0	7.4
Poly-SH	7.3	7.7	9.0	8.7	6.3	7.7	7.3	5.0	7.4
Quickstart(PST-2FQR)	7.3	7.0	9.0	7.7	6.0	8.0	7.0	7.0	7.4
LSD Value	1.2	1.0	0.9	1.0	0.8	0.6	0.7	0.9	0.3

and an overall average (mean). To best use this table, you must determine what locations are the closest geographically to your location.

The overall average is useful to gauge the cultivars' performance over many locations and is helpful in regional and national marketing. However, national averages can be misleading to the average consumer working within only one city or state.

The second table gives the same turfgrass quality data but presents it for each month collected. Evaluating this table can lead to a better understanding of the varieties that perform better or worse during particular months or seasons.

Many people use this table when deciding

on blends of varieties. An individual may want to blend a grass that performs well in spring but poor in summer with a good summer-performing grass.

When considering data from any NTEP table, there is a figure at the bottom — the "LSD Value" — that needs your attention. LSD (Least Significant Difference) Value is a statistical tool to determine if the difference incultivars areal difference or just happened by chance. To determine if a statistical difference exists among two cultivars, subtract the cultivar with the smaller value from the cultivar with the larger value. If the difference between the two numbers is not as large as **Continued on page 22**

PRODUCT FEATURE

	Spring g	reenup	leader	s in national ryegrass	tests		
Name Pinnacle Premier Accolade Saturn Stallion Affinity (GEN-90) Barrage 856 Envy Surprise Gator Manhattan II (E) Ovation Taya Troubadour WVPB-89-87A 4DD-Delaware Dwarf Danaro Entrar Loretta	103 7.7 7.7 8.0 7.3 6.7 7.3 6.0 7.3 6.0 7.3 7.3 6.0 7.3 7.3 6.7 7.3 6.7 7.3 6.7 7.3 7.5 6.7 7.5 6.7 7.5 6.7 7.5 6.7 7.5 6.7 7.5 7.5 6.7 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7	NJ3 6.0 5.3 4.7 6.7 5.3 5.7 5.0 6.3 4.3 5.7 5.0 6.3 4.3 5.7 5.0 4.7 5.3 5.0 5.0 5.0 5.0	Mean 6.8 6.5 6.3 6.3 6.3 6.3 6.2 6.2 6.2 6.2 6.2 6.0 6.0 6.0 6.0 6.0 6.0 5.8 5.8 5.8 5.8	Name Mulligan (NK 89001) N-33 PST-28M Regal SYN-P Unknown 89-666 Assure Lindsay MOM LP 3184 Legacy Pleasure Citation II Meteor OFI-D4 OFI-F7 PR 9119 PST-2B3 Repell LSD Value	ID3 6.0 6.0 6.0 6.3 6.3 6.3 6.3 6.3 6.3 6.7 6.7 6.3 6.3 6.0 6.3 6.0 6.3 6.3 6.3 8.0 6.3 8.0 6.3 8.0 7.0 8.0 8.0 8.0 8.0 8.0 8.0 8.0 8.0 8.0 8	NJ3 5.7 5.7 5.7 5.7 5.3 5.3 5.3 5.3 5.3 5.3 4.7 5.0 5.3 5.3 5.3 5.3 5.3 1.3	Mean 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8

Reading the tests correctly

Continued from page 21

the LSD Value, no statistical difference exists between these two cultivars for that particular characteristic.

Table 3 ranks quality ratings over each location. This table is useful for quickly determining the general performance of cultivars over different locations and regions.

No LSD Value is present at the bottom of this table, therefore, to determine statistical differences among cultivar. Consult the LSD Values found in Table 1.

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Find out how SunDevil from Medalist America can save you time, effort and money! Contact your Medalist representative today, 1-800-568-TURF.



Locations in Minneapolis, MN, Albany, OR, Downers Grove, IL, New Brunswick, NJ

Data on a number of "descriptive" turfgrass characteristics, including genetic color, density and leaf texture, are collected by one or more locations for each test.

With these descriptive characteristics, it is helpful to have data from many locations and use an average of these locations.

This approach of looking at overall averages is different from the approach for turfgrass quality (looking mainly at local averages) because the cultivar differences that exist with these descriptive characteristics mainly come from each evaluator's preference for a certain color or leaf texture rather than from a difference in environment or management of the turf.

Percent living ground cover can be collected in spring, summer or fall. Percent living ground cover is designed to express damage caused by disease, insects, drought, etc. This differs from density ratings which are designed to rate the number of living plants per unit area (excluding damaged patches).

Ground cover ratings help determine survival of turfgrasses through various stresses. Many people use ground cover ratings to determine how a grass survived the summer stress period and, consequently, how the percent ground cover changed (how well the grass recovered) in fall.

Certain diseases such as leafspot, red thread, dollar spot and brown patch occur quite frequently and uniformly in test plots. Therefore, the NTEP often contains data from several of these diseases in each progress report. Since disease organisms can vary between locations, it is important to choose varieties that have resistance to a particular disease at several locations — even though no data for that disease may have been collected at test sites nearest your location.

Also, tracking a cultivar's response to diseases over several Continued on next page

Best in leaf texture

Name	NJ3	Mean
Pick 89LLG	7.0	7.0
Affinity	6.7	6.7
Assure	6.3	6.3
HE 311	6.3	6.3
Repell II (LDRD)	6.3	6.3
WVPB 89-92	6.3	6.3
ZPS-28D	6.3	6.3
Brightstar (PST-GH-89)	6.0	6.0
Danilo	6.0	6.0
Dimenson (2H7)	6.0	6.0
Eagle (WVPB-89PRA3)	6.0	6.0
Elite (WVPB-88PRC23)	6.0	6.0
Legacy	6.0	6.0
Palmer II (P89)	6.0	6.0
Patriot II	6.0	6.0
Pick 1800	6.0	6.0
Pick 89-4	6.0	6.0
Pick 9100	6.0	6.0
Pick DKM	6.0	6.0
Prelude II (2P2-90)	6.0	6.0
PST-28M	6.0	6.0
PST-2FF	6.0	6.0
Quickstart (PST-2FQR)	6.0	6.0
SR 4200	6.0	6.0
SYN-P	6.0	6.0
Yorktown III (LDRF)	6.0	6.0
ZW 42-176	6.0	6.0
LSD Value	1.0	1.0

PRODUCT FEATURE

Getting readings straight

Continued from previous page years better indicates its true disease resistance under different environmental conditions.

Many diseases occur infrequently, if at all, in test plots. Many diseases, when they occur, do not distribute themselves uniformly across the test area, making an accurate estimation of resistance or susceptibility very difficult.

Diseases such as summer patch and necrotic ring spot seem to show their characteristic frog-eye symptoms only after significant levels of thatch are produced (usually two to four years after establishment).

Diseases such as powdery mildew occur mainly in shade. Some diseases are prevalent only in certain locations — like stem rust in the Pacific Northwest.

Making decisions concerning resistance to these infrequent diseases should follow these guidelines:

• Be careful using only one year's data from one locations. Look closely at the LSD Value. A high LSD Value that shows little statistical difference among all entries probably indicates that the disease was not distributed uniformly enough across the plot area.

• Only consider resistance to diseases that are problems in your area.

Data on resistance to certain insect pests is occasionally reported for NTEP tests. Often, insects do not appear uniformly across an entire test or in numbers large enough to cause significant damage. Therefore, when a high insect population does occur, the resulting data can be very beneficial.

Even though only one or two locations may report data on insect resistance, this data can be very useful in determining some level of resistance or susceptibility.

The NTEP progress reports also contain small amounts of data of several traits including vertical growth ratings, sod strength, winter kill and wear tolerance. This data helps determine the best culti-

Top in winter	r cc	lor
Name	DR9 /	Mean
Palmer II	8.0	8.0
Pick 89-4	7.7	7.7
Pick 9100	7.7	7.7
Pick DKM	7.7	7.7
Pick EEC	7.7	7.7
Poly-SH	7.7	7.7
Prelude II (2P2-90)	7.7	7.7
PST-23C	7.7	7.7
Affinity (GEN-90)	7.3	7.3
Brightstar (PST-GH-89)	7.3	7.3
Dimension (2H7)	7.3	7.3
Navajo (PST-2DPR)	7.3	7.3
Pick 1800	7.3	7.3
PS-105	7.3	7.3
Quickstart (PST-2FQR)	7.3	7.3
Repell II (LDRD)	7.3	7.3
7PS-28D	7.3	7.3
4DD-Delaware Dwarf	7.0	7.0
Advent	7.0	7.0
Eagle (WVPB-89PRA3)	7.0	7.0
Gettysburg	7.0	7.0
PR 9121	7.0	7.0
PST-2B3	7.0	7.0
PST-2FF	7.0	7.0
SYN-P	7.0	7.0
Yorktown III (LDRF)	7.0	7.0
ZPS-2EZ	7.0	7.0
ISD Value	1.1	1.1

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vars for those situations where these characteristics are important.

NTEP tests are shown at field days in many states. This is a good opportunity to see, first-hand, variety differences and discuss these with researchers. But keep in mind that you are looking at these varieties on only one day of the year and their appearance changes sometimes daily during the growing season.

The reports can be obtained from the National Turfgrass Evaluation Program, BARC-West, Bldg. 001, Room 333, Beltsville, Md. 20705.

Leading ryegrass varieties in terms of summer density

Name	NJI	NJ3	Mean	Name	NJI	NJ3	Mean
Affinity	7.7	6.7	7.2	PS-105	7.7	5.3	6.5
ZPS-28D	8.7	5.7	7.2	Assure	7.0	5.7	6.3
Brightstar	8.7	5.3	7.0	Eagle (WVPB-89PRA3)	6.7	6.0	6.3
Repell II	7.7	6.3	7.0	Express	7.0	5.7	6.3
SYN-P	8.0	6.0	7.0	Pick 1800	6.7	6.0	6.3
Advent	7.7	6.0	6.8	PST-28M	6.7	6.0	6.3
Gettysburg	8.0	5.7	6.8	Yorktown III (LDRF)	7.0	5.7	6.3
Pinnacle	7.7	6.0	6.8	OFI-F7	6.7	5.7	6.2
Quickstart(PST-2FQR)	8.3	5.3	6.8	Legacy	7.0	5.3	6.2
SR 4200	8.0	5.7	6.8	MOM LP 3147	7.0	5.3	6.2
Pick DKM	7.3	6.3	6.8	Palmer II (P89)	7.0	5.3	6.2
89-666	7.3	5.7	6.5	Pick EEC	7.3	5.0	6.2
APM	7.7	5.3	6.5	PST-290	7.0	5.3	6.2
Pick 89-4	7.0	6.0	6.5	PST-2FF	7.3	5.0	6.2
Prelude II (2P2-90)	7.0	6.0	6.5	LSD Value	1.8	1.1	1.0

IS THE STRESS OF OVERSEEDING GIVING YOU NIGHTMARES?



We understand how stressful overseeding can be. You want a high quality temporary turf that won't cost you a fortune. Your job depends on it!

That's why we developed V.I.P., a blend of three top-rated turf type perennial ryegrasses (no Poa here). The V.I.P. blend has an exceptional dark green color and fine texture.

V.I.P. greens up quick and keeps your turf looking lush and green, all winter long. Plus, you don't have to worry about those troublesome transitional months.

So say goodbye to overseeding nightmares. Get the best overseeding value. Get V.I.P., and sleep easy.



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