Plant Patent - ARS

APPLICATION FOR APPROVAL OF __X__ CULTIVARS _____ ASSOCIATE CULTIVARS

1. Crop: Hybrid bermudagrass (2n = 27)

2. Experimental no. or name: MI40

3. Pedigree and history: MI40 is one of 66 finer-textured mutants induced with 8000 rads of Cobalt 60 gamma radiation in Midiron in February of 1983. It has been selected for its tolerance to close mowing, quality, mole cricket resistance and greenup characacteristics.

4. Description: MI40 has performed well or has been superior in three experiments at Tifton and one experiment in each Griffin, GA.; Oklahoma; Kentucky; and Florida. MI40 is superior in quality to Midiron in tests that were mowed 3x per week at 0.5 or 1.0 inch (Tables 1 and 2). It has been equal to Tifway 2 in quality. It has quality similar to Tifgreen in two tests mowed at 1/4 inch (Tables 3 and 4) and one test mowed at one inch (Table 5). It has survived well in Oklahoma and Kentucky (Tables 6 and 7). MI40 was the only entry showing no mole cricket damage in two tests at Tifton in 1993 (Tables 2 and 3).

5. Station(s) where developed: Forage and Turf, Agricultural Research Service, USDA, and the Georgia Coastal Plain Experiment Station, University of Georgia, College of Agriculture, Tifton, Georgia.

6. Participating scientist(s): Wayne Hanna, Robert Carrow, Joel Barber (OK), A.J. Powell (KY), Southern Turf Nurseries.

7. In what respect is the new cultivar superior to the cultivar now in use? or reasons for proposing release as an associate cultivar. MI40 adds genetic diversity to the selection of high-quality bermudagrasses that are available. Turf quality of MI40 is significantly better than Midiron, from which it was derived. It has the cold tolerance that allows it to grow as far north as Stillwater, OK and Lexington, KY. MI40 shows mole cricket resistance.

8. Method of propagation: Vegetative

9. Amount of breeder seed stocks available (if applicable): 15 x 15 feet plot.

10. Amount of foundation seed stocks available (if applicable): NA

11. Amount of cutting or bud material available for vegetatively propagated material for nursery distribution (if applicable): NA

12. Is there likely to be unusual difficulty encountered in the production of any class of seed stocks? Explain. No.

13. Three suggested names for the cultivar. Tift 94;

14. Name approved by plant cultivar and germplasm release committee.

15. Form of intellectual property protection: Limited distribution exclusive.

16. Is a royalty assessment recommended: __X__ Yes _____ No

RECOMMENDED BY:

A. _____
Originating Scientist

B. _____
Department Research Leader

C. _____
Department Head

D. _____
Chairperson, GAES Plant Cultivar and Germplasm Release Committee

E. _____
Associate Director of the Appropriate Station

APPROVED:

_____
Director of Experiment Stations

Table 1. 1991 ratings[†] on turf bermudagrasses (Midiron mutants) established 8-25-83 at Tifton, GA[‡].

Cultivar[‡]	Quality 8/14	Quality 10/6
MI40	8.0	8.0
Midiron	6.0	5.5
LSD (0.05)	1.6	1.6

[†]Quality: 1 = poor, 9 = best

[‡]The best of 53 entries in the test. Plots were cut 3x each week at one inch from 1984 to 1991.

Table 2. Ratings[†] on bermudagrass cultivars established 6-26-87 at Tifton, GA[‡].

1991 Ratings

Cultivar	Quality 5/31	7/13	8/14	10/6	11/5	x	Greenup 3/28	Color 10/6	11/5
MI40	8.0	7.5	7.0	8.5	9.0	8.0	2.0	9.0	4.5
Tifgreen	5.5	5.0	5.5	6.5	6.0	5.7	3.5	3.0	2.0
Tifway 2	8.0	5.5	6.5	7.5	7.5	7.0	2.5	9.0	4.5
Midiron	4.0	3.5	2.5	4.0	4.0	3.6	2.0	3.0	2.0
LSD (0.05)	0.9	1.9	1.5	2.0	1.8	1.6	1.3	1.0	0.9

1992 Ratings

Cultivar	Quality 5/1	6/18	8/4	9/1	9/25	11/23	x	Color 11/23	12/4	12/10	1/11/94
MI40	8.5	8.0	7.0	9.0	9.0	9.0	8.4	4.0	4.0	3.0	3.0
Tifgreen	4.5	5.0	5.0	5.5	3.5	5.0	4.8	3.0	3.0	2.0	2.5
Tifway 2	7.0	8.0	6.0	8.0	7.5	8.0	7.4	4.0	3.5	3.0	3.0
Midiron	2.5	4.0	2.0	3.5	2.5	2.5	2.8	2.0	1.5	1.0	1.0
LSD (0.05)	1.6	1.2	2.0	1.6	1.8	1.3	1.6	1.3	0.9	0.7	0.9

1993 Ratings

Cultivar	Greenup 3/30	Color 4/23	12/17	Quality 4/23	6/9	7/16	9/16	10/19	11/23	12/17	x	MoleCricket Damage 10/20	12/17
MI40	2.0	8.1	5.5	8.0	8.0	8.0	8.5	8.5	8.5	9.0	8.4	1.0	1.0
Tifgreen	2.0	4.5	3.0	4.5	3.0	4.0	3.5	2.0	2.5	2.0	3.1	5.4	4.0
Tifway 2	2.0	6.3	5.0	6.5	6.0	8.0	7.0	7.0	7.5	7.0	7.0	2.7	2.5
Midiron	1.0	3.6	3.5	3.0	3.0	2.5	2.5	2.5	3.0	2.0	2.6	5.4	2.5
LSD(0.05)	0.8	2.2	2.0	2.1	2.5	1.9	2.2	2.4	2.5	2.7	2.3	2.3	3.2

[†]Greenup: 1 = brown, 5 = green; Color: 1 = brown, 9 = green; Quality: 1 = poor, 9 = best; Mole cricket damage: 1 = none, 9 = severe.

[‡]Experiment consisted of 2 replications of 9 x 9 feet plots. Plots were mowed 3x each week at 1/2 inch height. Plots received 500 lbs/A 5-10-15 and 100 lbs/A N in March of each year and 50 lbs N/A in each June and August of each year. Plots were irrigated to prevent extreme stress. Test was sprayed with 2 lbs/A 2,4-D in March of each year. Test had 32 entries.

Table 3. 1993 ratings[1] on bermudagrass test planted 5/18/92 at Tifton, GA[2].

Cultivar	Greenup	Quality								Color		Mole Cricket Damage	
	3/30	4/23	6/9	7/16	9/16	10/19	11/23	12/17	x	11/23	12/17	10/20	12/17
MI40	1.5	7.0	7.5	7.0	7.5	7.0	7.5	7.5	7.2	4.0	5.0	1.0	1.0
Tifdwarf	4.0	8.5	8.0	9.0	9.0	9.0	7.0	8.0	8.4	3.0	3.0	5.4	3.5
Tifgreen	3.0	8.0	7.0	8.0	7.0	7.5	8.0	8.5	7.7	3.5	4.0	5.4	3.5
LSD(0.05)	1.2	1.4	1.2	1.1	0.9	1.4	1.1	1.0	1.2	0.8	1.3	2.2	1.2

[1]Greenup: 1 = brown, 5 = green; Quality: 1 = poor, 9 = best;
Color: 1 = brown, 5 = green (on 12/17, 9 = green)
Mole cricket damage: 1 = none, 9 = severe

[2]Mowed three times per week at 1/4 inch. Fertilized with 500 lb/A 5-10-15 and 100 lbs N/A in March of each year. Fertilized with 50 lbs of N/A in June and August of each year. Sprayed with 2 lbs/A 2-4,D in March of each year. Irrigated to prevent extreme stress. Test consisted of 2 replications of 9.5 x 8.5 feet plots.

Table 4. Ratings[†] on Midiron mutants at Griffin, GA[‡]. (Test conducted by Robert Carrow).

	1991				
	Turf coverage (%)	Quality			Color
Cultivar	4/3	4/3	5/24	$\bar{x}$	5/24
MI22	90	5.1	7.3	6.2	7.3
MI40	78	4.9	6.7	5.8	7.1
Tifgreen	92	5.2	7.1	6.2	7.0

[†]Quality: 1 = poor, 9 = best; Color: 1 = brown, 9 = green

[‡]Planted on 6-20-90. Mowed at 1/4 inch. Received 4.0 lb. N/1000 ft^2/yr.

Table 5. Ratings[†] on turf bermudagrass planted at Lake Wales, FL on 7-24-91. (Test conducted by Southern Turf Nurseries).

	Ratings on 3-25-93		
Cultivar	Density	Color	Quality
MI40	7.5	4.0	8.0
Tifdwarf	9.0	4.0	8.5
Tifgreen	9.0	3.5	9.0
LSD (0.05)	1.0	0.8	1.3

Rated two weeks after last frost. Mowed once per week at one inch. Plots were 13 x 14 feet, two replications. Density: 1 = open, 9 = dense; color: 1 = brown, 5 = green; Quality: 1 = poor, 9 = best. Test consisted of 12 cultivars.

Table 6. 1991 ratings[†] on bermudagrass cultivars at Stillwater, Oklahoma[‡]. (Test conducted by Joel Barber).

Cultivar	Greenup 4/10	Greenup 4/19	Quality 7/10
	%	%	
MI22	80	100	7
MI40	80	100	7
MI53	50	70	5
Tifgreen	Dead	Dead	Dead

[†]Quality: 1 = poor, 9 = best

[‡]Planted June, 1990. Fertilized with 0.5 to 1.0 lbs. N/1000 sq. ft. per month. Mowing height started at 0.75 inch and gradually reduced to 0.4 inch. Plots = single, 31 x 31 feet plots.

Table 7. Ratings[†] on Midiron mutants at Lexington, KY[‡]. (Test conducted by A.J. Powell).

Cultivar	% Cover 1991 May	% Cover 1991 July	% Cover 1991 Sept.	Quality 1992 x	Quality 1993 x	Texture 9-24-92	Texture 1993 x
MI35	43	97	100	5.4	5.8	7	7.5
MI40	63	98	100	6.3	6.2	7	7.3
MI53	63	100	100	6.3	6.1	7	7.3
Tifway 2	25	77	100	4.6	5.3	7	7.2
LSD (0.05)	49	36	22	2.1	1.7		1.0

[†]Quality: 1 = poor, 9 = best; Texture: 1 = coarse, 9 = fine

[‡]Planted July 15, 1991. Maintained at .75 inch. 1992 and 1993 ratings have not been received at the writing of this proposal but A.J. Powell stated by phone that all 4 of the above have performed well.