

Characterization of Genetic Off-types in ‘Celebration’ Bermudagrass by Inferred Ploidy Level through Flow Cytometry

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Vegetatively propagated turfgrasses such as *Cynodon dactylon* ‘Celebration’ (2n=36), bermudagrass, are inspected visually for genetic off-types by the Southern Seed Certification Association. A lanky yellow-green (LYG) off-type was observed in fields under certification. We genetically characterized off-types by flow cytometry.³ Among 11 paired samples from farms (Celebration vs. LYG), 7 of 11 LYG off-types, when planted from a single stolon and grown out, had estimated DNA content consistent with 2n=3x=27 (Table, below) and were morphotypically homogeneous, but differed from putative ‘Celebration’ genotypes, nearby in the same field which had inferred 2n=4x=36. While there were inconsistencies in 4 of 11 off-types, LYG off-types in ‘Celebration’ are not environmental variation.



LYG off-type spots in ‘Celebration’ bermudagrass. Left and right, spots found during inspection; center, spots killed before harvest.

Primary collection	Grow-out morphotype	pg DNA/2C	Inferred ploidy	pg DNA/ploidy	Paired off-type collection	Grow-out morphotype	pg DNA/2C	Inferred ploidy	pg DNA/ploidy	Comments
Celebration morphotypes with inferred 2n=4x					Lanky yellow-green off-types with inferred 2n=3x					
C003	Celebration	3.76	4x	0.94	C003-LYG	LYG	2.83	3x	0.94	
C005	Celebration	3.71	4x	0.93	C005-LYG	LYG	2.93	3x	0.98	
C007	Celebration	3.80	4x	0.95	C007-LYG	LYG	3.10	3x	1.03	
C017	Celebration	3.66	4x	0.92	C017-LYG	LYG	3.17	3x	1.06	
C019	Celebration	3.64	4x	0.91	C019-LYG	LYG	3.05	3x	1.02	
C021	Celebration	3.74	4x	0.94	C021-LYG	LYG	3.00	3x	1.00	
C023	Celebration	3.69	4x	0.92	C023-LYG	LYG	3.02	3x	1.01	
.	Average		3.01		1.00	
.	Minimum		2.83		0.94	
.	Maximum		3.17		1.06	
.	Inconsistent off-types					
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C009	Celebration	3.95	4x	0.99	C009-LYG	African	2.45	2x	0.82	
C011	Celebration	3.70	4x	0.93	C011-LYG	Tetraploid?	3.32	3x	1.11	
C001	Celebration	4.10	4x	1.03	C001-LYG	Common	3.80	4x	1.27	Ran two samples
C025	Celebration	3.98	4x	1.00	C025-LYG	LYG	4.08	4x	1.36	Ran two samples
Average		3.79		0.95						
Minimum		3.64		0.91						
Maximum		4.10		1.03						
Standards with known ploidy										
Celebration	Celebration	3.77	4x	0.94						
TifEagle	TifEagle	3.05	3x	1.02						

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³ CyStain absolute P kit with extraction buffer and staining buffer and stained with propidium iodide.