

Updating Florida's Annual Ryegrass Breeding Program.

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The first author was drawn to annual ryegrass (*Lolium multiflorum*) when he viewed a reseeding stand of annual ryegrass at Kinderlou, GA in 1970. He soon began an evolutionary recurrent selection program using this ecotype and others. He continued to add new breeding nurseries until he had contributed to over 30 new cultivars. A number of cobreeders and cooperators helped in developing diploid and tetraploid cultivars, some with excellent cold tolerance, all having good crown rust (*Puccinia coronata*) resistance and some resistance to Helminthosporium leaf spot (*Drechslera* spp.) disease. In the last 10 years there was some selection for resistance to the gray leaf spot (*Pyricularia grisea*) disease. The experimental name, cobreeder's name, a brief description of attributes of each cultivar, the germplasm sources used in breeding, the seed company producing seed and the official name of cultivar will be reported. The success of the breeding program is due to ryegrass cooperators in Florida and other states aiding in testing of each new cultivar. These coauthors continue the Florida ryegrass program in developing new diploid and tetraploid ryegrass.

**Florida Experimental Annual Ryegrass Populations
November, 2007**

Experimental Name	Description	Derived From	Seed Company (year) [Cultivar name]
FL X1980 ER	Very early maturing, crown rust resistant 2X.	Kinderlou and other ryegrasses	DLF-International Seeds (1982) [Florida 80]
FL X1986 LR	Later maturing, crown rust resistant 2X. (PVP)	Marshall	DLF- International Seeds (1989) [Surrey]
FL X1994 (FXF) ER [early]	Very early maturing crown rust resistant (2X) annual ryegrass. (Grown by WVPB in 1994-95.)	Fla 80 X FL Rust Resistant	Smith Seed Services (SSS) (1995) [Not Marketed]
FL X1994 (FXF) ER [late]	Early maturing crown rust resistant (2X) annual ryegrass. (Grown by WVPB in 1994-95.)	Fla 80 X FL Rust Resistant	SSS (1995) then Ampac (1999) [Fantastic]
FL X1995 (GXS) MR late	Medium maturity crown rust resistant (2X) annual ryegrass.	Gulf X FL X1986 LR (late)	Advanta Seeds Pacific (1998) Sold to Forage Genetics (2000) and then to East Texas Seed Co. [Brigadier]
FL X1994 B-7 (4X) select (Released jointly with WVPB)	A disease resistant 4X cultivar with good forage and seed yields.	FL 1988 AR B-7 (4X). Crossing nurseries both in Florida and OR	Olsen Fennel [1996] then ABT and ProSeeds Marketing [Natchez] Stopped marketing in 2005

FL X1995 LR [early]	An advanced generation med-late Surrey type (2X) annual	FL X1987 LR (late) select (All Surrey background)	Olsen-Fennel (1995) then ABT and ProSeeds Marketing [Stampede]. Stopped marketing in 2006
FL/OR X1993 AR-ME (4X) (Released jointly with WVPB.)	A high forage & seed yielding 4X annual ryegrass with good crown rust and stem rust resistance.	1988 AR-ME (4X) Nurseries both in FL and OR.	Smith Seed Services [1993] [Big Daddy]
NC/FL X1997 LRCT (Released jointly with NCSU [Paul Mueller breeder])	Late cold-tolerant crown rust resistant (2X) annual ryegrass. Jointly owned: ½ UF & ½ NCSU	NSCU 91 x FL X1993 LR Nurseries both in FL and in NC	Pro Seeds Marketing (1998) then Saddle Butte Ag (2002) [Florlina]
FL X1997 Passerel + (owned by Pennington Seed Co.)	Added crown rust resistance to the 2X cultivar under contract. We get no royalties.	Passerel given three selection cycles for crown rust resistance.	Pennington Seed Co. [1997] [Passerel Plus]
FL X1997 (G) 4X LR	Late maturing, high forage and seed yielding 4X with good disease resistance traceable to Surrey. (PVP)	Doubled FL X1993 LR select, an advanced population from Surrey, by DSV in Germany.	Smith Seed Services (1998), then Barenbrug (2001) [Jumbo]
FL X1997 (New) 4X late (bulk)	Late maturing crown rust resistant 4X with good yields and seed production.	From FL X1995 4X LR late and other FL 4X ryegrasses planted starting 1988-89 and 1989-90	Forbes Seed & Grain Co. (1997) [Beef builder III]
FL X1998 (New) 4X LR late	Late maturing, high forage and seed producing crown rust resistant 4X ryegrass.	FL X1994 (4X) late, Marshall (4X), FL X1994 B-7 (4X) & FL 1996 ARME (4X), and FL X1996 (G) 4X LR	Advanta Seeds Pacific (1998) Sold to Forage Genetics (2000) then to E. Texas Seed Company 2000 [Prine]

FL X1998 (New) 2X LR	A late maturing, high forage and seed yielding crown rust resistant 2X.	FL X1994 LR elite, Passerel, FL X1993 AR-90-1 and others.	American Seed Producers (1998) then Seed Research (2003) [Graze-N-Gro]
FL X1998 (New) MR	Medium maturing, high forage and seed producing crown rust resistant 2X.	FL X1995 ER late, FL X1995 (GXS) MR and others.	Lewis Seed Company (1998) [King]
FL X1998 (S-II) LR	A late, high forage and seed yielding, crown rust resistant 2X traceable to Surrey.	Surrey and other ryegrasses traceable to Surrey.	DLF-International Seeds (1998) [Surrey II]
FL X1999 (GA) LR	Late maturing, high forage and seed yielding, 2X with crown rust resistant and some GLS resistance.	Surrey and other ryegrasses traceable to Surrey (Selected 2 cycles at Green Acres)	Smith Seed Services (1999) [Ed]
FL X1998 (New) ER	Very early maturing crown rust resistant 2X with good forage and seed yields for an early cultivar.	Derived from FL Rust Resistant, FL 80 and other early FL genotypes	ProSeeds Marketing (1999); then Plainview Seed Co. (2004) [Florida 98]
FL/OK X2001 (New 1) LRCT (developed jointly with Jerry Baker of Noble Foundation)	Good late maturing 2X ryegrass with good forage and seed yields. Excellent CR resistance, good stem rust resistance and some GLS and HLS resistance.	Intermating of Marshall commercial and breeders seed with FL/NC X1997 LRCT and FL X1997 LR (New) late select. Nurseries in both FL and OK.	Seed Research (2001) [Bruiser]. Stopped production in 2005 and not resold yet.
FL X2001 (New) 4X LR mid-late	A high forage and seed yielding 4X with excellent CR resistance and some resistance to HLS and GLS.	FL X1994 4X late select, Marshall 4X, Natchez and Big Daddy. Early FL X1997 (G) 4X LR in latter cycles.	Seed Research (2001) [Striker]

FL X2001 [New 1] 4X LR late	A superior forage and seed producing 4X with excellent CR resistance, good SR resistance and some resistance to HLS and GLS.	FL X1994 4X late select, Marshall 4X and some Natchez and Big Daddy. FL X1996 (G) 4X LR late in later cycles.	Pennington Seed Co. (2001). Smith Seed Services (2004) [Attain]
FL/NE X2002 [New 2] LRCT, developed jointly with David Baltensperger at Scottsbluff, NE	An excellent cold- tolerant, CR-resistant, late maturing 2X with some resistance to HLS and GLS.	Marshall, Florlina and Siken. Five cycles of selection at both FL and NE.	Olson Seed Company (2004) Ragin and Massey (2007) [Stockaid]
FL X2002 (LA3) LRCT	Late maturing, CR-resistant 2X with good cold tolerance and some resistance to HLS and GLS.	Marshall, Florlina, Siken, LA ecotype and FL X1998 [New 2] LRCT. Selected at both Marianna and Gainesville.	Ragin and Massey Seed Co. (2002) Reassigned to Lewis Seed Company (2005). [Not named yet]
FL X2002 (DRU) LR	A late maturing crown rust resistant 2X ryegrass with some resistance to HLS and GLS. Should have good cold tolerance but untested to date.	Passerel Plus and Florlina intercrossed in cycle 1. Selected plants were then crossed with FL/NE X2002 (New 2) LRCT and 'Ed' in cycle 2. Nurseries planted through 4 cycles at Gainesville DRU unit.	Burlingham Seed Company (2002) [Thunder]
FL X2003 (New 3) LRCT	Late maturing, CR-resistant, 2X with good cold tolerance and some resistance to HLS and GLS.	FL/OK X2001 (New 1) LRCT and FL X2001 (New 2) LRCT and Passerel Plus that survived 1999-2000 and 2000-2001 winters in NE.	Barenbrug (2003) [Not named yet]

FL X2003 (BD) 4X LRCT	Late-maturing, CR-resistant, cold tolerant 4X with good forage and seed yields.	Developed from Big Daddy, T-3, and NE/FL X 1999 (4X) LRCT and FL X 2001 4X LRCT.	Smith Seed Services (2003) [Big Boss]
FL X2004 (G) 4X ER LS	Early maturing crown rust and GLS 4X with good forage and seed yields..	Developed from doubling of FL X1994 (FXF) ER early by DSV in Germany.	Barenbrug (2004) [Not named yet]
M/FL X2004 (New 4) LRCT, developed jointly with Dr. Ann Blount. She was lead breeder.	Late maturing 2X with good forage and seed yields, excellent crown rust resistance and some HLS and GLS resistance. Should have good cold resistance over entire annual ryegrass belt.	FL X1998 (New 1) LRCT, FL 1998 (NC) LRCT, NE X 1998 Sikem, Marshall breeders seed and FL X1998 (New 2) LRCT were intercrossed at Gainesville and Quincy. Last nurseries at Marianna, FL	American Grass Seed Producers (2004) [Ocala]
M/FL X2005 (4X) LRCT jointly developed with Dr. Ann Blount at Quincy and Marianna, FL.	Crown rust resistant 4X cultivar with high seed and forage yields and resistance to HLS and GLS disease. Should have wide adaptation for a 4X ryegrass.	Jumbo +++ was intercrossed with NE X2001 (4X) LRCT that survived winter at Scottsbluff, NE in 2000-01 season and early cycle of Big Boss. Nurseries at Quincy, Marianna, and Gainesville, FL.	Olsen Seed Co. (2005) Ragin and Massey (2007) [Not named yet]
FL/NE X2006 (Misc. 2X) LRCT developed jointly with David Baltensperger at Scottsbluff, NE.	A crown rust resistant 2X cultivar with some resistance to HLS and GLS. Excellent cold tolerance, adapted to all parts of annual ryegrass belt.	Surviving plants of 8 ryegrass cultivars that survived winter 2000-01 at Scottsbluff, NE and one other cold tolerant genotype. Nurseries both at NE and FL.	OreGro Seed Company (2007) [Not named yet]

Abbreviations:

Abbreviations for Diseases:

PVP = Plant Variety Protection

HLS = Helminthosporium Leaf Spot

SR = Stem Rust

CR = Crown rust

GLS = Gray Leaf Spot