

From: [Plant breeding activities and graduate students at TAMU](#) on behalf of [C. Wayne Smith](#)
To: TAMU-PLANTBREEDING@LISTSERV.TAMU.EDU
Subject: October Plant Breeding Bulletin
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Attachments: [Plant Breeding Bulletin October 09.pdf](#)
[Plant Breeding Bulletin October Nelson.doc](#)
[C. Wayne Smith1.vcf](#)

Attached is the October Texas A&M Plant Breeding Bulletin. Dr. Lloyd Nelson has had a distinguished career and made significant contributions to plant improvement. I hope that you enjoy reading about his accomplishments.

Regards,
Wayne

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TEXAS A&M PLANT BREEDING

October 2009



Dr. Lloyd Nelson began his career with Soil and Crop Sciences at the Texas AgriLife Research and Extension Center at Overton in 1976. He has co-advised graduate students and served on several graduate students committees. He initially conducted plant breeding in soft red winter wheat for grain and forage yield improvement, and annual ryegrass (*Lolium multiflorum*) for forage production. Much of his early wheat research was focused on fungal diseases of wheat in the high rainfall region of east Texas, such as leaf rust, powdery mildew, and glume blotch (*Stagnospora nodorum*). This research effort resulted in the release of germplasm having partial resistance to *S. nodorum*. He also served as a consultant on Septoria diseases in Brazil, Argentina, Bolivia, Paraguay, Uruguay and Chile. He has written a chapter in *Advances in Agronomy* (Vol. 44) entitled "Breeding Wheat for Resistance to *Septoria nodorum* and *Septoria tritici*". Located in east Texas, Lloyd has and continues to have a deep interest in forage potential of small grains. He has conducted forage clipping evaluations on wheat, oats, rye, and triticale for the past 33 years. Oftentimes these forage clipping experiments have been ideal environments for epidemics of powdery mildew, leaf rust, and stem and stripe rust. Disease data gathered on experimental lines has often been useful to the Texas small grain breeders from dryer areas of Texas. He has cooperated closely with all small grain breeders in Texas and adjoining states to evaluate their advanced lines for forage potential and disease resistance. This cooperation has resulted in Lloyd being listed as a co-author in the release of many small grain cultivars over the past 30 years.

Lloyd's research since 1995 has concentrated on breeding annual ryegrass for improved forage potential and improving the turfgrass quality of annual ryegrass. Gulf ryegrass, released by in 1963 by R.M. Weihing at the Beaumont Center and expressing improved Crown Rust resistance, was the leading annual ryegrass grown by Texas producers from the mid 1960s until the early 1990s. However, Gulf would often winterkill when grown in central and north Texas. Lloyd made a 3-way cross between Gulf (for its crown rust resistance), cultivar Marshall for winter hardiness, and an experimental ryegrass derived out of Dr. Ethan Holt's (retired Texas A&M Plant Breeder) program which had high forage yield potential in 1976 that provided progeny that lead to the selection of TAM 90 annual ryegrass. The

progenitor of TAM 90 was grown at the Texas AgriLife Research and Extension Center at Amarillo with the cooperation of Dr. Kenneth Porter and screened for winter hardiness and also was screened at the Research Station at Angleton for crown rust resistance. TAM 90 was released in 1990 and became a highly successful annual ryegrass cultivar for Texas.



More recent forage breeding efforts involved the release of tetraploid ryegrass cultivars. Earlier cultivars, such as Gulf and TAM 90 are diploids. Germplasm derived from TAM 90 was treated with chemicals to effect a doubling of chromosomes from 14 to 28. This 4x germplasm was crossed with other 4x germplasm to produce new populations. Selections for superior forage producing lines were screened at Overton and Beaumont, Texas for forage yield potential and crown rust resistance. This research resulted in the release of TAMTBO and Tetrapro cultivars and his latest release, TXR2006-T22 will be named Nelson and marketed by Wax Seed Company.

Dr. Nelson began selecting dwarf type ryegrass germplasm for its potential as a cool season turfgrass in the early 1990s. Forage type ryegrass cultivars such as Gulf and TAM 90 were and are far too vigorous and fast growing to be used for overseeding warm season turfgrass. After several years of testing his first turf annual ryegrass cultivar was released in 2000 as Axcella. While Axcella was greatly improved for dwarfiness, it did not have the desirable dark green color found in most perennial ryegrass cultivars. Subsequently, he released Panterra turf ryegrass in 2003 and Axcella 2 in 2006. Both cultivars were significantly improved for color, leaf fineness, and other turf quality traits. These cultivars are used to overseed warm season turf on football and soccer fields and to provide a green turf year around. Panterra ryegrass has been overseeded on Kyle Field and the soccer field at Texas A&M University. He anticipates the release of Intercross ryegrass in 2009, which is a cross between Axcella and an Intermediate height ryegrass. Intercross ryegrass is similar to some perennial ryegrass cultivars except that it will transition out, or die, as an annual ryegrass so as not to damage the perennial warm season turf. Presently he has crossed annuals with perennial ryegrass and is selecting for turf quality comparable to perennial, yet with a transition date similar to a late annual.

Another objective of his annual ryegrass turf breeding program is to breed for tolerance to high salinity soils and irrigation water. Grant funds provided by USGA are supporting screening of ryegrass germplasm both in the greenhouse and in the field at Pecos, Texas. Greenhouse screening methods include growing ryegrass in cone-tainers placed in high salinity water in salt tanks. This technique has been modified presently whereby germplasm is being grown in soil in flats which are immersed in salt water every 3 days to simulate high salinity. Salt concentration is gradually increased over time until severe salt damage can be recorded on each entry.

You can find more information on Dr. Lloyd Nelson's breeding program at <http://overtan.tamu.edu/ryegrass> Dr. Nelson can be contacted at lr-nelson@tamu.edu.

Monsanto supported PhD Graduate Assistantships:

Texas A&M University Department of Soil and Crop Sciences and Monsanto announces the availability of Monsanto Ph.D. Graduate Assistantships in Plant Breeding. Applicants must have earned a minimum 3.5 GPA on their M.S. course work, demonstrated an aptitude for research, and meet all other requirements for admission to Texas A&M, including completion of the GRE. Successful candidates will be required to register for nine hours of course work each fall and spring semester and six hours during the summer. Annualized salary is \$ 24,000, all tuition and required fees are paid by the assistantship, and group health insurance is available. Dissertation research will be in the area of crop improvement through the application of breeding and genetics. Additional information and application protocol can be found at <http://soilcrop.tamu.edu> or by contacting Dr. Wayne Smith, Soil and Crop Sciences, 2474 Texas A&M University, College Station, TX 77843-2474, (979-845-3450 or cwsmith@tamu.edu).

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