MISSISSIPPI AGRICULTURAL AND FORESTRY EXPERIMENT STATION
MISSISSIPPI STATE UNIVERSITY, MISSISSIPPI STATE, MS 39762

NOTICE OF RELEASE OF 'THAD' RICE

The Mississippi Agricultural and Forestry Experiment Station, Mississippi State University (MSU) announces the release of a new rice (*Oryza sativa* L.) variety 'Thad'. It is an early maturing, semidwarf, and long-grain conventional variety with great yield potential and adaptation to Mississippi and the southern USA. Thad has the 'Newrex' cooking profile that makes it superior for parboiled and canned rice. Its low chalk and excellent milling, grain, and culinary qualities make Thad highly suitable for domestic and export markets seeking high-quality rice. This new variety was developed at MSU's Delta Research and Extension Center (DREC), Stoneville, MS by MSU rice breeders Drs. Dwight Kanter, Tim Walker, and Ed Redoña, with support from the Mississippi Rice Promotion Board.

Also known by its experimental name RU1104077, Thad was developed using a modified pedigree method involving several rounds of selection and reselection. The original cross involved as female parent 'Rosemont' and as male parent '863270', an F_5 selection from the cross 19830047 that was made at the University of Arkansas (with pedigree of 'Mars/Newrex//Tebonnet/Bellemont'). The F_1 and early generations were planted in Stoneville from 1989-1992. Derivative line 92-2430 was entered in the observational trial (OT) in 1995 and preliminary (PYT) and state yield trials (ST) from 1996-1997. In 1998, the line was entered in the Uniform Regional Rice Nursery (URRN) as RU9804054. It was then entered in the Mississippi On-Farm Variety Trial (OFVT) in 1999 as 99 CLV OF-207 and was subjected to reselection and purification in 2000 before being reentered in the OT in 2002 and PYT/STs from 2003-2005. Reselection and purification was conducted again in 2005 to 2006 before the line was reentered in the OT in 2009, PYT in 2010, and URRN and the OFVT from 2011-2015 as RU1104077. Breeder and foundation seed production activities for RU1104077 were conducted from 2013-2015.

Among rice varieties still in commercial use today, Thad is most similar to CL163, another high-yielding and high amylose MSU-developed variety. However, unlike CL163, Thad does not possess the gene for imidazolinone herbicide tolerance and thus is considered as a non-Clearfield® type similar to 'Rex', the most popular conventional variety in Mississippi since 2013. In 30 individual Mississippi-wide trials conducted from 2011 to 2015, involving up to seven locations each year, the average rough rice yield of Thad (10,353 lbs/ac, 11605 kg/ha) was slightly lower compared to Rex (10,529 lbs/ac, 11,803 kg/ha) and CL163 (10,514 lbs/ac, 11,786 kg/ha). The average mature plant height of Thad was 40 inches (101.6 cm) compared to 42 inches (106.9 cm) for Rex and 41 inches (104.1 cm) for CL163. Thad averaged 91 days to heading compared to Rex (89 days) and CL163 (90 days). Whole milled rice percentage was slightly lower for Thad (56%) compared to CL163 (57%), and Rex (58%) but its total milled rice (69%) was higher than that of Rex (68%) though lower compared to CL163 (70%).

Thad tillers well, the culms have an erect growth habit with erect flag leaf, and is non-sensitive to photoperiod. Thad's straw strength is similar to those of Rex and CL163 (lodging intensity = 1.0) but Thad has less percentage lodging compared to CL163 (4% versus 14%) in small plot trials. The leaves of Thad are glabrous with the husks becoming straw colored at maturity. The mature grain is glabrous and without awn under most conditions. The ripened grains of Thad are not scented, have a light brown pericarp, and are non-glutinous. The length of rough and milled kernels of Thad averaged 0.35 inches (9.0 mm) and 0.26 inches (6.6 mm) compared to 0.38 inches (9.6 mm) and 0.26 inches (6.7 mm) for Rex.

Thad has a high apparent amylose content and intermediate gelatinization temperature resulting in the 'Newrex' cooking profile. In four years of field trials (2012-2015) Thad averaged 25.2% apparent

amylose content which was similar to that of CL163 but higher than that of Rex (19.8%). Both Rex and Thad had average alkali spreading scores of 3.2 which were lower than the 3.5 score for CL163. In grain and milling quality tests conducted in 2015 to 2016, Thad gained unanimous acceptability among seven major rice mills in the US and a major rice importer from Costa Rica. With low-chalk and unique properties, Thad has good potential for capturing value in the contract/identity preservation markets as well as export markets for US rice where high amylose rice types are preferred based on consumers' eating preferences.

Thad is susceptible to rice blast (*Magnaporthe oryzae*) races IB1, IB45, IB49, IB54 IC17, IEK1K, and IE1. Thad is similar to Rex in that it is rated susceptible to sheath blight (*Rhizoctonia solani*). It is rated intermediate to bacterial panicle blight (*Xanthomonas campestris* pv. oryzae) and moderately resistant to the straighthead disorder. Thad should be planted with a fungicide, insecticide, and a GA_3 seed treatment.

Limited quantities of foundation THAD seed were distributed to Mississippi certified seed growers in 2016. Mississippi State University has applied for Plant Variety Protection for Thad. Under Title 5 Plant Variety Protection, Thad shall be sold only by variety name as a class of certified seed. A royalty of one cent per pound will be collected on certified seed sold. Small seed quantities of Thad will be available for research purposes from Dr. Ed Redoña, Delta Research and Extension Center, P.O. Box 197, Stoneville MS 38776; 662-686-3284; ed.redona@msstate.edu. It is requested that appropriate recognition of the source be given if Thad contributes to the development of a new germplasm line or cultivar. Seed will also be deposited in the National Center for Genetic Resources Preservation and National Plant Germplasm System.