Rice Genetic Stocks Collection

The USDA Genetic Stocks – Oryza (GSOR) Collection at DBNRRRC serves as distribution center for genetic mutants and molecularly characterized genetic resources that are important to the rice research community. These genetic stocks have been created using specialized techniques such as induced mutation and cross-breeding. The GSOR program is responsible for storing, maintaining, documenting, and distributing (free of charge) these materials to the scientific community for use in genetic and genomic research. Ultimately these materials will aid in the understanding of the genetic control of traits that can be used to enhance the development of new cultivars that meet the needs of the U.S. rice industry.

Types of Entries Within the GSOR Collection

Collections within the GSOR are unique sets of material that have been described/donated by an individual researcher.

A deletion is defined as a fragment of DNA that was deleted from the rice genome. A deletion mutant is a rice line that carries this altered genome. These are useful to study the function of DNA sequences by evaluating how traits are impacted when a gene is “knocked-out” or deleted.

Individual mutants are lines that have been purposely mutated using chemicals and have novel characteristics such as male sterile (used to make hybrids), lesion mimic (used to study disease response), early flowering, double dwarf, colored hulls, and giant embryo.

Mapping populations are used to study the genetic variation which occurs as a result of recombination of genes from two differing parental lines. The mapping populations in the collection are segregating for agronomic traits, disease resistance, maturity, yield, milling quality, and cooking quality.

TILLING (Targeting Induced Local Lesions In Genomes) is a reverse genetics technique that uses traditional chemical mutagenesis to create libraries of individual rice plants can be evaluated using high throughput screens for the discovery of mutations. (Source: http://tilling.ucdavis.edu/index.php/Main_Page)

The graphic at the right shows the assignment of the 12 chromosomes of rice to different nations that participated in the International Rice Genome Sequencing Project. In 2005, this international consortium produced the complete genetic sequence of the Japanese cultivar, Nipponbare. This sequence information will serve as the baseline for comparison with other rice varieties to identify genes that control economically important traits. GSOR serves as an international distributor of the exact source of Nipponbare that was sequenced for use in genomic research.

Distribution Activity to U.S. and International Researchers

85,553 genetic stocks were distributed during the years 2004 through 2017 (combined). 15,645 genetic stocks have been distributed thus far during 2018.

Inventory codes indicate source of GSOR seeds. The six-digit code shows the location, year, season, and purity of seed. 1 2 3 4 5 6:

1 = location (A-Arkansas, T-Texas, P-Puerto Rico, G-Greenhouse in Arkansas),
2-3= Year (last 2 digits of production year(s),
4-5 = Season (Fall, Spring, Summer, Winter), and
6=Purity (1=panicle, 2=plant, 3=bulk).

Example: A11FA3 = Arkansas, 2011, Fall, Bulk harvest.

Our website has been updated! Choose Genetic Stocks Oryza link on the Dale Bumpers main page at www.ars.usda.gov/main/dbnrrc

Resources available on the website include a collection catalog, link to GRIN Global and germination procedures for hard-to-grow rice germplasm.

GRIN-Global is now available for use by GSOR customers! Please visit the new website here: https://npgsweb.ars-grin.gov/gringlobal/search.aspx?

Contact GSOR at rsgrin@ars-grin.gov if you have any questions.

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