

Glossary of Rice Industry Terms

Aging – physiological changes that rice undergoes predominately during the initial three postharvest months.

Amylopectin – one of two major starch molecules characterized by glucose units arranged in a linear, unbranched chain. Higher concentrations contribute to drier, less sticky cooked rice.

Anthesis – the series of events between the opening and closing of the rice flower (spikelet). Also referred to as flowering.

Aromatic (scented) Rice – rice that contains high concentrations of volatile constituents yielding an aroma similar to roasted popcorn or nuts.

Auricles – clasping appendages arising at the junction of the leaf blade and the leaf sheath.

Basmati Rice – a type of aromatic rice that tends to cook into long, slender grains that are dry, separate and fluffy.

Barrel – a unit of measure of rough rice used in some areas of the U.S.; equivalent to 162 pounds of rough rice (3.6 bushels).

Booting – the stage prior to heading characterized by the swelling of the leaf sheath as the panicle grows in size and the internodes elongate, pushing it up through the leaf sheath. During this stage, meiosis occurs and the pollen is formed. It is one of the stages most vulnerable to environmental stresses.

Bran – the outer layers or coverings of brown rice; composed of the pericarp, seed coat and aleurone layer. (Note: industrial bran normally is a mixture of bran and embryo).

Breeder Seed – Seed reserved for licensed plant breeders for the production of foundation, registered or certified seed; marked with a white tag.

Brewers Rice – small pieces of broken rice kernels.

Brown (cargo) Rice – the rice kernel with the protective hull removed.

Bushel – a volumetric measure of rough rice approximately equivalent to 45 pounds of rough rice.

Caryopsis – the mature fruit of grasses in which the seed coat firmly adheres to the pericarp.

Certified Seed – produced by planted either registered or foundation seed and guaranteed for purity by the State Plant Board; marked with a blue tag.

Chalky Rice – rice that has a brittle texture due to loose packing of starch granules in the grain; resulting in weaker grain that is more susceptible to breaking.

Coleoptile – the topmost part of the embryo axis that serves as a protective sheath for young leaves and the growing point during seedling emergence.

Converted Rice – *see parboiled rice*. The term “converted rice” is a trademark.

Crown – the compacted section at the base of the stem containing the nodes for new tillers and buds for new roots.

Culm – a commonly used name for the stem of a grass-type plant, such as rice, consisting of nodes and hollow internodes.

Cultivar – an inclusive term that represents lines, hybrids, selections, or varieties of crops. (See also **Hybrid, Variety**)

Embryo (germ) – the reproductive portion of the rice grain located on the ventral side.

Endosperm – the white central portion of the rice grain, composed primarily of starch.

Enrichment – the addition of specific nutrients to partially compensate for those lost during the milling process. Regulations in the U.S. specifically stipulate that enrichment for rice must contain thiamine, niacin, and iron and may contain riboflavin.

Flag Leaf – the last leaf to develop on a tiller that emerges during the boot stage and fully extends in the full boot stage. A major source for carbohydrates and nutrients for the developing panicle.

Flowering – (*see Anthesis*)

Fortification, Glazing – (*see Enrichment*)

Foundation Seed – produced by planting breeder seed. Is reserved for licensed plant breeders but may be produced under the direct supervision of a licensed plant breeder to maintain genetic purity and identity of the cultivar. Used to produce registered or certified seed; marked with a white tag.

Gelatinization Temperature – the temperature at which irreversible swelling of the starch grains leads to formation of a gel (induced by hot water).

Genetically Modified Organism (GMO) – a plant or animal that has a gene inserted from another organism resulting in the expression of a desirable trait.

Green Ring – (*see Panicle Initiation*)

Hard Dough Stage – part of the process of grain ripening characterized by a firm whole kernel but moisture content greater than 20 percent.

Heading – growth stage when the panicle exserts from the boot, often synonymous with anthesis or flowering of the spikelets. Heading date is defined as the time when 50% of the panicles have at least partially exserted from the boot. It takes about 10 to 14 days for a field to complete heading.

Head Rice – after milling, unbroken kernels of rice and broken kernels which are at least three-fourths the length of an unbroken kernel. Usually expressed as a percentage of rough rice (referred to as head rice yield [HRY]).

Heat Damaged Grains – kernels of rice which have a reddish-brown to orange color and are substantially darker than the majority of the grain. This defect may occur in either white or parboiled rice.

Hull – the outer covering structures (palea and lemma) that enclose the rice kernel.

Husk – (*see Hull*)

Hundredweight (cwt) – a mass measurement of rice yield equal to 100 pounds of rough rice (2.22 bushels).

Hybrid – the first-generation progeny of a cross between two plants of the same species but have different genetic backgrounds (e.g., different varieties or lines).

Imbibition – initial process of seed germination characterized by water absorption into the seed.

Indica Rice – subspecies of rice that typically is long-grain, has high amylose contents, profuse tillering, high pubescence (hairy leaves); typically grown in tropical climates; tends to cook dry, loose and fluffy.

Instant Rice – a type of precooked rice that is easily rehydrated at temperatures below boiling. Typically it is fully hydrated in less than 5 minutes when added to boiling water.

Internode Elongation – the period when the internodes elongate and the plant grows in height. It begins about the time of panicle initiation (PI) and continues until the plant reaches its full height. Internode elongation is often called “jointing”.

Japonica Rice, Temperate – subspecies of rice characterized as medium- and short-grain rice with low amylose content (10-20%) which causes it to cook wet and sticky; typical of most U.S. medium- and short-grain varieties.

Japonica Rice, Tropical – subspecies of rice characterized as long-grain rice with intermediate amylose contents (20 to 25 percent), low tillering, smooth leaves (not hairy); typical of most U.S. long-grain varieties.

Jasmine Rice – an aromatic long-grain rice that cooks moist and often clings together.

Lemma – the part of the rice hull which covers two-thirds of the surface area of brown rice.

Length, Kernel – the distance between the most distant tips of the kernel.

Ligule – a membranous fringe on the inner side of the leaf at the top of the leaf sheath of rice and other grass plants.

Maximum Tillering – the point at which the maximum tiller number is reached and the main culm is difficult to distinguish from the tillers.

Meiosis – the process of cell production which reduces the chromosome number in the new cells by one-half the number in the parent cells (reduction division). Sex cells are formed by meiosis.

Mesocotyl – the internode between the scutellar node and the coleoptile.

Milk Stage – the first step in the grain-ripening process characterized by developing starch grains in the kernel that are soft and the interior of the kernel is filled with white liquid resembling milk.

Mill, Rice – a machine for removing the bran from the endosperm. Mills are of two general types: *polishers* that rub the bran off (friction-type mill or pearlier) and *whiteners* that grind or strip the bran away.

Milled Rice – whole or broken kernels of raw or parboiled rice from which the hulls, bran, and germ have been removed. Usually expressed as a percentage of rough rice.

Milling, Degree of – the extent to which the bran layers and germ are removed from the rice endosperm.

Milling Yield – after milling, the quantity of total milled rice produced in the milling of rough rice to a well-milled degree (includes all kernels whole and broken), usually expressed as a percent of rough rice (total milling yield [TMY]), but when specified may be expressed a percent of brown rice.

Palea – the part of the rice hull which covers approximately one-third of the surface area of brown rice. Its edges fit inside those of the lemma forming a tight closure.

Panicle Differentiation – when the young panicle has grown about 1 to 2 mm long and can be seen by the naked eye. Generally occurs about 5 to 7 days after panicle initiation when the internode is $\frac{1}{2}$ to $\frac{3}{4}$ inch in length.

Panicle Initiation (PI) or Panicle Primordia

Initiation – corresponds to the time when the fourth leaf from the top begins to elongate, approximately 30 days before heading. The panicle is not visible to the naked eye. Often called *green ring* or *beginning internode elongation*.

Parboiled Rice – rice that has undergone a parboiling process.

Parboiling (converting) – a hydrothermal process in which the crystalline form of starch is changed into an amorphous one, typically accomplished by soaking, steaming, and drying rough rice; typically increases the percentage of head rice and the vitamin content in the milled rice.

Pecky Rice – discoloration of rice grain due to rice stink bug feeding, environment, diseases, and other factors; generally results in easily broken kernels.

Physiological Maturity – the end of the grain filling period, at which time growth increases are in balance with metabolic losses.

Polishing – the removal of traces of bran that remain after milling; resulting in a smooth surface that has a glossy appearance (see **Milled Rice**).

Quality, Rice – the composite of characteristics that differentiate individual units of rice and have significance in determining the degree of acceptability by the consumer. Rice quality components include milling quality; cooking, eating, and processing quality; nutritional value; and specific standards for cleanliness and purity.

Quick Cooking Rice – rice that has been pretreated so as to substantially reduce the cook time, especially rice that has been cooked in water, steam, or both, then dried in such a manner as to retain an open, porous structure without clumping.

Red Rice – rice of the same genus and species as white rice but characterized by a red seed coat. The hull may be black or straw-colored. Noxious weed because of discoloration of white rice.

Registered Seed – used to produce certified seed. Produced by planting breeder or foundation seed; marked with a purple tag.

Rough (paddy) Rice – whole or broken unhulled kernels of rice.

Shell – (see **Hull**)

Stabilized Rice Bran – rice bran that has been treated to essentially inactivate or inhibit enzymes that hydrolyze lipids to release free fatty acids.

Soft Dough Stage – part of the grain-ripening process characterized by the initial starch formation in the grain. The interior of the kernel is firm, but still soft.

Tillering – production of tillers which are shoots that develop from the leaf axils at each un-elongated node of the main shoot and from other tillers. Tillers are produced in a synchronous manner, the n th leaf on the main culm (or tiller which is producing tillers) and the first leaf of the tiller on the $(n+3)$ th leaf emerges simultaneously.

Variety – a genetically pure line of a crop species that exhibits certain traits; seed will produce plants that exhibit the same traits as the original plant. An experimental line becomes a variety when it is officially named and released for commercial production.

Vegetative Lag Phase – the period from the end of active tillering (maximum tiller number) to the beginning of the reproductive stage which occurs upon initiation of the panicle primordial.

Waxy Rice – rice whose starch contains less than 2 percent amylose.

Width, Kernel – the distance across the kernel at the widest point.

Y-Leaf – “young leaf”; the youngest, fully developed leaf on the plant.

