

## M-209 RICE: DESCRIPTION AND MANAGEMENT GUIDELINES



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### M-209

#### Introduction:

M-209 is a high yielding, early maturing, semi-dwarf, smooth hulled (glabrous), Calrose-type medium grain rice cultivar. It was developed by the California Cooperative Rice Research Foundation, Inc. (CCRRF) at the Rice Experiment Station (RES), Biggs, CA and released to growers in April 2015. M-209 is protected under the US Plant Protection Act, Title 5 (to only be sold as a class of certified seed) as well as a US Plant Utility Patent. M-209 is available exclusively to California rice growers, export of seed is prohibited, and use in genetic or breeding research requires a Material Transfer Agreement.

#### Pedigree and Breeding:

Its pedigree is M-205/5/M-201/M7//M-201/3/M-202/4/M-204. M-205 is a high yielding, glabrous, early maturing Calrose variety released by RES in 2005 and adapted in warmer and more favorable rice growing areas in California. M-202 is a popular photoperiod insensitive, early maturing, cold tolerant, semi-dwarf medium grain released by the RES in 1985. M-201 was released in 1982, has short stature and early maturity while M7 is a late maturing, glabrous, short-statured medium grain released in 1977. M-204 was released in 1992 and is photoperiod insensitive, early maturing, glabrous, semi-dwarf medium grain variety. M7, M-201 and M-204 are no longer in commercial production. M-209 was tested in the 2010-14 University of California Cooperative Extension (UCCE) statewide tests under the experimental designation 08Y3269.

#### Agronomic Characteristics:

Table 1 contains a summary of the agronomic data collected in the UCCE Statewide Yield

Tests. Seedling vigor scores were similar to M-205 and M-206. M-209 heading averages 2 days earlier than M-205 but 6 days later than M-206. Its lodging % has been similar to M-205 and less than M-206 and M-202. Overall statewide yield advantages for M-209 were 10, 5, and 2% over M-202, M-205, and M-206, respectively. Commercial seed production field yields ranged from 98 to 107 cwt/acre in 2015.

Table 1. Agronomic performance in UCCE Statewide Yield Tests 2010-2014.

Variety	Grain Yield (lb/a)	Seedling Vigor (1-5)	Days to 50% Heading	Plant Height (in)	Lodging (%)
Early Tests					
M-202	8,900	5.0	89	40	29
M-205	9,510	4.9	93	39	6
M-206	9,540	4.9	85	40	28
M-209	9,790	4.9	91	39	7
Very Early Tests					
M-202	8,830	5.0	94	38	15
M-205	8,870	5.0	97	36	17
M-206	9,440	5.0	88	38	21
M-209	9,620	4.9	95	37	15
Intermediate-Late Tests					
M-202	9,540	5.0	89	41	25
M-205	9,140	4.8	92	39	17
M-206	9,310	4.9	83	39	32
M-209	9,440	4.9	90	41	17
Overall					
M-202	8,820	5.0	91	40	24
M-205	9,250	4.9	94	38	11
M-206	9,480	4.9	86	39	26
M-209	9,680	4.9	92	39	11

Nursery tests indicate that M-209 had comparable stem rot scores as M-205 and better reaction compared to M-202, M-206, and M-208. It has better reaction to aggregate sheath spot compared to M-206 and M-208. It has no blast resistance gene to the blast

pathogen as M-202 and M-206. However, the field resistance of M-209 to blast is not known. Growers are recommended to bleach-treat seed for Bakanae. No marked difference in sensitivity to standard rice herbicides from the parent varieties has been observed, however commercial experience is limited.

**Milling and Quality:**

Head rice yields and stability in a range of harvest moistures are superior to M-202 but slightly below M-206. The milled rice grains of M-209 are heavier (1000-grain =22.1 grams) and slightly longer (length=5.94 mm) compared to M-205 (21.4/5.87) and M-206 (21.3/5.70).

Table 2. Average percent head rice and total milled rice (H/T) from 2011 to 2014 of M-209, M-202, M-205, and M-206 at harvest grain moisture content percentage (%MC) above 22%, 18-22%, and below 18%.

Variety	H/T at Harvest %MC		
	above 22%	18-22%	below 18%
M-209	62/69	65/71	64/72
M-202	63/68	62/67	57/67
M-205	65/70	65/70	63/71
M-206	65/70	66/70	63/70

M-209 physico-chemical properties are similar to other Calrose medium grains. It was evaluated by a number of mills and marketing organization and judged acceptable to the Calrose rice market.

**Area of Adaptation:**

Grain yield trend analysis indicates that M-209 is better suited in high-yielding locations with a high-input production system. Results from the San Joaquin location and

cold greenhouse tests indicate that M-209 may suffer more from cold-induced blanking if grown in cooler rice areas, although it appears more blanking tolerant than M-205. This entry is intended in areas where M-205 and M-202 are grown and competitive in areas where M-206 is grown, especially in more favorable rice growing environments.

**Management Guidelines:**

The following guidelines are based on research, observation and experience gained in developing M-209. These suggested cultural practices are intended to assist in the production of optimum yields and quality.

- Uniform water depth, adequate fertility, uniform seed distribution and good weed control practices are important because they maintain uniform heading and harvest moisture which in turn increase head rice milling yield.
- Fertilizer rates and other management practices should be similar to those for other medium grain varieties in your production area. Excessive N will increase lodging, blanking, and disease.
- Preferred seeding dates are the same as for other California varieties and M-209 is not recommended for late plantings because of the risk of cool temperature induced sterility (blanking). Standard seeding rates of 130 to 150 lb/acre are recommended, although good yields at lower seeding rates were reported when good stands were achieved. Excessive seeding rates reduce yield potential and increase susceptibility to disease.

- Water depth should be increased to about 8 inches after panicle initiation (50 to 55 days after planting) to protect developing panicles from low temperature exposure during occasional cool nights.

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