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CALIFORNIA RICE VARIETIES

Description and Performance Summary of the 1990 and Multiyear Statewide Rice Variety Tests in California

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Introduction

University of California rice cultivar evaluation trials were conducted in the Sacramento and San Joaquin Valleys in cooperation with the California Cooperative Rice Research Foundation, Inc. (CCRRFI) and the United States Department of Agriculture (USDA). The tests, conducted by UC Cooperative Extension, compare advanced breeding lines with commercially available rice cultivars and evaluate preliminary breeding lines to determine their adaptation to the principal rice growing regions of the state. The program is partially funded by the Rice Research Board and California rice growers provide land and on-site management for the trials. This report describes the results of the 1990 regional rice testing program. The names and a brief description of the current publicly developed cultivars are listed in Table 1.

General Summary of the 1990 Season

In the 1990 season California growers harvested 395,000 acres of rice. Medium-, short- and long-grain varieties represented 89%, 5.8% and 4.7% of the acreage respectively. Two medium-grain varieties, M-202 (68%) and M-201 (11%) exceeded the combined

acreage of short- and long-grain types. The premium quality medium-grain variety M-401 was produced on 7.7% of the acreage. Leading short- and long-grain varieties were S-201 (2.6%) and L-202 (4.3%).

The season began in the midst of a four year drought with acreage limited by water availability. Earliest plantings (before April 15) escaped severe wind damage, but most of the planting period was characterized by strong north or south winds making stand establishment difficult. Heavy unseasonable rains (exceeding 2 inches over most of the acreage) and cool weather at the end of May further inhibited stand establishment. Late planted acreage increased slightly due to replanting and increased water availability. Excellent weather throughout the vegetative stage allowed individual plants to compensate for poor stands with good tiller development. Thus statewide average yields were 7,600 lbs/A as compared to 7,900 lbs/A in 1989 and 7,000 lbs/A in 1988. Yields of long grain were 7,200 lbs/A, short grain 7,500 lbs/A and medium grain 7,600 lbs/A. Hot and windy weather during the harvest season increased grain dry down and reduced milling quality. Maximum and minimum daily temperature data for Butte County (Durham station) and Sutter County (Nicolaus station) are presented in Table 2.

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Experimental Procedure for the 1990 Regional Rice Variety Tests

Eighteen trials to evaluate rice cultivars were carried out at nine farm locations in the rice growing counties of California. Two classes of tests were conducted at each site: (1) Advanced tests consisting of advanced breeding lines and commercial varieties, and (2) preliminary tests consisting of lines to be newly evaluated on a statewide basis. Cultivars in each test were generally restricted to a single maturity group to avoid too early or too late maturation relative to the field variety of the test location. A total of 24 statewide advanced and preliminary trials for the three maturity groups were tested in separate fields at the Rice Experiment Station (RES), Biggs, California. Advanced tests were arranged in randomized complete block designs with four replications. In order to screen a larger number of experimental entries, preliminary lines were planted in two replications only. Maturity groups and locations were as follows:

Very Early Maturity Group. Four uniform tests were conducted at (1) the RES [Butte County], (2) the Skinner Ranch [Butte County], (3) the Brumley Ranch [San Joaquin County], and (4) the Lauppe Ranch [Sutter County]. Eight advanced breeding lines and nine commercial varieties were included in the entries. Twenty-six preliminary breeding lines were also evaluated in uniform tests at each location.

Early Maturity Group. Five uniform tests were conducted at (1) the RES [Butte County], (2) the Lovelace Ranch [Colusa County], (3) the Rieke Ranch [Merced County], (4) Geer and Son's [District 108, Yolo County], and (5) the Mohammed Ranch [District 10, Yuba County]. Eleven advanced breeding lines and nine commercially available varieties were tested at all sites. Twenty preliminary breeding lines were also evaluated in uniform tests at each location.

Late Maturity Group. Three uniform intermediate-to-late maturity tests were conducted at (1) the RES [Butte County], (2) the Wylie Ranch [Glenn County], and (3) the Shannon Ranch [Sutter County]. Eight advanced breeding lines and five commercial varieties were tested at each location. Twenty-one preliminary breeding lines also were tested in uniform trials at each location.

Characteristics measured for each entry were seedling vigor, days to 50% heading, plant height, lodging at harvest, grain moisture at harvest and grain yield at 14% moisture. Seedling vigor was rated subjectively by visual observation on a scale of 1 (poor) to 5 (excellent) at three to four weeks after planting. Scores were based on plant health and stand at crop emergence (through the water). Days to 50% heading measured the number of days from planting to when 50% of the heads were free from the boot. Plant height was measured at harvest as the distance from the soil surface to the tip of the panicle. Plant lodging was rated visually on a scale of 1 (no lodging) to 99% lodging (all plants completely lodged).

County trials were harvested with a SWECO 324 combine and trials at the Rice Experiment Station were harvested with an Allis-Chalmers combine. Both machines are modified for small plot harvesting and all plots had a harvest area of 150 square feet (.0034 A). Grain was subsampled at harvest for moisture determination and final grain yield was adjusted to 14% moisture.

Agronomic Performance Summary of 1990 and Multiyear Varietal Entries by Maturity Group

Varietal performance summaries are presented by location for each maturity group followed by over-location and multiyear, multilocation grain yield summaries. Only the yields of commercial varieties and ad-

vanced experimental cultivars are summarized in the multiyear multilocation tables. Comparative yield in the latter is expressed as a percentage of a standard based only on equivalent location and year means.

Summary of the Very Early Rice Variety Tests (<90 days to 50% heading at Biggs, CA)

The 1990 very early maturity tests were conducted at the four locations previously described. Commercial standards at all locations included S-101, S-201, Calmochi-101, Valencia '87, M-103, M-201, M-202, M-203, and L-202. Eight advanced breeding lines were compared with the standards. Twenty-six preliminary breeding lines were also tested at each location. The advanced lines included four short-, two medium- and two long-grain types. The preliminary lines included six short-, ten medium- and ten long-grain types.

Tables 3 through 10 show the agronomic performance of these lines at each location. Tables 11 and 12 give the over-location summaries. Entries are ranked by yield with the highest yielding entries appearing first.

Average yields of the advanced lines and commercial standards in Sutter County were highest (10,360 lbs/A), followed by Butte (RES) (9,660), Butte (9,100), and San Joaquin (8,920). Over all locations (Tables 11 and 12), the highest yielding cultivar was the preliminary line 89-Y-190 (a medium grain). Several other cultivars also produced yields in excess of 10,000 lbs/A, including three preliminary lines (89-Y-347, 88-Y-142, and 89-Y-374) and two advanced lines (89-Y-124 and 88-Y-774). 88-Y-774 (recently released as L-203), was among the top four yielding cultivars at all four locations. None of the cultivars produced yields significantly higher than 88-Y-774 at any location.

The highest yielding, very early commer-

cial standards were S-101 and M-103. M-201, an early cultivar, was the highest yielding commercial standard in the over location summary and was among the top three yielding entries in three of the four tests. M-203 was the lowest yielding commercial standard, probably due to taller plant height and lodging. At the cooler San Joaquin site, Calmochi-101 was the highest yielding entry, followed by 87-Y-125, an advanced short grain. Several of the preliminary lines also produced yields over 9,000 lbs/A at this location. Average grain moisture at harvest for the advanced lines and commercial standards ranged from a low 15.2% at San Joaquin to 18.6% at Sutter.

Seedling vigor ratings were unusually low at Sutter, possibly due to cool conditions in the Natomas area. Heading at this location was also somewhat delayed, averaging 94 days after planting (up 7 days from 1989). At San Joaquin, where temperatures are typically cooler, seedling vigor was not severely reduced. Heading, however, was delayed and averaged 98 days after planting.

Lodging occurred in low to moderate severity at each location and was especially severe with M-203. Of the very early commercial standards, lodging of Calmochi-101 was most severe. At all locations, preliminary breeding line trials planted adjacent to commercial standard and advanced line tests exhibited less overall lodging, indicating strong lodging resistance in many of the preliminary lines.

Table 13 shows the over-year and location yields for the very early commercial cultivars. Common year-location entries are compared to give relative yield as a percentage of the standard, M-103. S-101, M-202, and Calmochi-101 yielded 98%, 104%, and 103% of M-103, respectively, over a five-year period. Since its entry into the statewide testing program, 88-Y-774 (L-203) has yielded 109% of M-103, based on equivalent year/location comparisons.

Summary of the Early Rice Variety Trials
(90-97 days to 50% heading at Biggs, CA)

The 1990 early maturity tests were conducted in the five locations previously described. Commercial standards at each location included S-101, S-201, Calmochi-101, Valencia '87, M-103, M-201, M-202, M-203, and L-202. Eleven advanced breeding lines were compared with the standards and twenty preliminary lines were also tested at each location. The advanced lines included four short-, four medium-, and three long-grain types. The preliminary lines included six short-, six medium-, and eight long-grain entries.

Tables 14 through 23 show the agronomic performance of these lines at each location, and Tables 24 and 25 give the over-location summaries. Entries are ranked by yield with the highest ranking entries appearing first.

Average grain yields of the advanced line and commercial standard tests ranged from 7,310 lbs/A at Merced to 9,540 lbs/A at Biggs. Several of the advanced lines yielded 9,000 lbs/A or higher. Entry 88-Y-317 (a medium grain) ranked first in yield over locations, averaging close to 9,600 lbs/A. Entry 88-Y-774 (L-203) was among the top five yielding entries in four of the five tests. Over locations, Valencia 87 was the highest yielding commercial variety ranking first at Colusa (9,310 lbs/A) and Yolo (11,490 lbs/A). In comparison to the advanced lines, M-201, L-202, and M-202 ranked 7th, 8th and 13th in yield, respectively, while M-203 was the lowest yielding commercial variety in four of the five tests. As mentioned, the low yield of M-203 is most likely a result of the lodging sensitivity of this cultivar.

Of the preliminary lines, entry 90-Y-82 averaged 10,200 lbs/A over locations and was the highest yielding preliminary line at four of the five sites.

As in 1989, seedling vigor of the advanced long-grain lines was not signifi-

cantly different from L-202, indicating acceptable performance with respect to this trait. Although the preliminary long grains 89-Y-442 and 89-Y-484 exhibited lower seedling vigor, these cultivars ranked 5th and 6th in yield, respectively, when compared to preliminary lines over locations. On average, most entries headed earlier than S-201 (100 days after planting) and most headed after M-202 (93 days after planting). Valencia 87 and S-101 headed at 91 days after planting and had the lowest average moisture at harvest (15.1%).

Lodging was especially severe at the Yolo site, averaging 89% and 86% lodging in the advanced and preliminary tests, respectively. Lodging also was moderately severe at Butte and Colusa. The advanced long grain 90-Y-70 showed good lodging resistance at Yolo and excellent lodging resistance at Butte and Colusa. With the exception of M-203 at Yuba, overall lodging at Merced and Yuba was much less severe and yields did not appear to be affected.

Table 26 shows the over-location and over-year yields for early cultivars. M-201 was used as a standard to compare common year-location summaries. Based on twenty trials conducted over the last five years, S-201, L-202, M-202 and M-203 have yielded 99%, 100%, and 103% of M-201, respectively. Although M-203, which is susceptible to blanking and has weak straw, has yielded only 85% over the last five years, this cultivar is a premium quality rice which commands a higher price than M-201 or M-202.

Summary of the Intermediate and Late Rice Variety Trials (>105 days to 50% heading at Biggs, CA)

The 1990 intermediate and late maturity tests were conducted at the three locations described previously. Standards at each location included S-301, M-401, and A-301. Eight advanced lines (four short, three medium, and one long grain) were compared to the standards as well as M-202 and M-203

(early standards). Twenty-one preliminary lines, including five short-, seven medium - , and nine long-grain types were also evaluated in comparison with L-202 (an early long grain) at each location.

Tables 27 through 32 show the performance of these lines at each location and Tables 33 and 34 give the over-location summary. Entries are ranked by yield with the highest yielding entries appearing first.

Average yields of the advanced lines and standards were significantly higher at Butte (10,070 lbs/A) than at Glenn (9,490 lbs/A) or Sutter (8,240 lbs/A). Yields at the Sutter location may have been affected by a moderate to heavy weed infestation. Over locations, S-301, A-301, M-202, M-401, and M-203 ranked first, third, tenth, twelfth, and thirteenth in yield, respectively. Several preliminary lines including 89-Y-519, 89-Y-506, and 89-Y-528, produced yields above 11,000 lbs/A at Butte. A-301, an aromatic long grain, yielded 10,700 lbs/A at Glenn, and ranked first at this location. The cultivar 89-Y-296 (a medium grain) was the highest yielding preliminary line in the Butte and Glenn County trials. None of the preliminary long-grain cultivars yielded more than L-202 in the over location summary. Most of the long-grain entries were harvested at

moistures 2 to 3% lower than the short- or medium-grain cultivars, due to the differences in dry down time between the grain types.

Although the Butte trial was planted approximately two weeks later than the Glenn County trial, average heading dates were about 5 days earlier at Butte. In contrast, M-401, a late maturing cultivar, headed at 116 days at both Butte and Glenn. Although planted on April 20th, M-202 and M-203 headed at 101 days in the Glenn County trial. Days to heading was not measured at the Sutter site.

Overall lodging was light-to-moderately severe in the Glenn and Sutter trials and was severe only on a few cultivars at Biggs. A-301 and 89-Y-485 (also a long grain) showed strong lodging resistance at all three locations.

Table 35 compares late maturing commercial cultivars in over-location/year tests. Using M-401 as the standard for comparison, A-301 and S-301 have yielded 92% and 105% of M-401, respectively, over the last five year period.

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Table 1. Characteristics of publicly developed rice varieties, 1990.*

Grain Type	Maturity	Seed widely available	Stem rot score ¹	Comments
Short Grain				
S-101	Very Early	1989	4.9	Three inches shorter than S-201, heads 7 days earlier and ready to harvest 10-12 days earlier than S-201. Translucent kernels 13% smaller than S-201. Rough leaves, hulls and awns have made harvesting and handling difficult. Grains dry down rapidly during ripening. Adapted to S-201 area.
S-201	Early	1981	5.2	High yield potential, excellent seedling vigor, similar to M-201 in maturity and in resistance to blanking; has good pearl shape.
S-301	Intermediate	1992	4.7	Field maturity 5-7 days later than S-201. Smooth leaves and hulls with very few awns. Yield potential comparable to S-201. Seedling vigor equal to M-202 with good resistance to low temperature blanking. Head rice yield superior to S-101 and S-201. Translucent kernels 13% smaller than S-201, have fewer green and white kernels at harvest.
Medium Grain				
M-103	Very Early	1990	4.9	Earliest variety, vigor less than M-202 and M-102, excellent resistance to blanking. Good head and total milled rice yields. Moderate lodging, good yield potential, about 3% less than M-202 at normal planting dates. Alternative variety for M-202 in coldest rice producing areas and for late (or delayed) planting in warmer areas.
M-201	Early	1984	4.8	Very high yield potential; 2 inches shorter than M-202 with excellent resistance to lodging. Threshes very easily so reduce reel and cylinder speed to minimize shatter and enhance head rice. Best resistance to stem rot but susceptible to aggregate sheath spot.
M-202	Early	1987	5.2	Very high yield potential; adapted to cooler growing areas where M-201 is not well adapted, and for general use; 3 days earlier, ripens more uniformly and more resistant to blanking than M-201; moderate lodging; threshes easily but does not shatter; not as resistant to stem rot as M-201 or M-102.
Long Grain				
L-202	Early	1986	5.3	Good yield potential in warmer areas; not adapted to colder areas; shortest of current varieties; excellent resistance to lodging. Seedling vigor fair; requires careful water management for stand establishment. Threshes easily so reduce cylinder speed to minimum to enhance head rice. Harvest moisture for L-202 should <u>not</u> be below 18% or above 21%.
Specialty Rices²				
M-203	Early	1992	6.2	Premium quality rice with large seeds. It is an early maturing mutant of M-401 (heads 17 days earlier). M-203 is susceptible to blanking and has weak straw. N management similar to M-401 recommended. M-203 is not a substitute for M-201 or M-202 and yields have been 15% below M-202.
M-401	Late	1983	5.8	Premium quality rice with large seeds; is susceptible to blanking, lodging and damage from early drainage; therefore use somewhat less N than on other varieties.
Calmochi-101	Very Early	1987	4.8	A sweet rice 2 weeks earlier than S-201; excellent resistance to low temperature blanking; has rough leaves and hulls; no awns. Grains dry down rapidly during ripening. Be careful not to contaminate with other varieties.
A-301	Intermediate	1988	5.2	An aromatic ("popcorn" aroma) long-grain with moderately high yield in warmer areas, not adapted to late seeding dates, deep water or cool areas. Suggest harvest moisture of 20-22% and air drying without heat to retain maximum aroma. A-301 has excellent straw strength.

Proper management of the short-stature varieties to obtain high yield include: (1) managing water depth and other factors to obtain a dense stand; (2) good weed control; (3) adequate nitrogen fertilization; (4) increase water depth to about 8 inches at 65 to 70 days after seeding; (5) drain as late as possible before harvest.

¹Average stem rot score where 1 = no disease and 10 = killed.

²Specialty varieties should not be grown unless arrangements have first been made with marketing agency.

*Prepared by the California Co-operative Rice Research Foundation and the University of California Cooperative Extension.

Table 2. Comparison of daily temperature patterns between Butte and Sutter Counties, 1990.

Month	Butte		Sutter		Month	Butte		Sutter	
	Max	Min	Max	Min		Max	Min	Max	Min
April									
1	75	41	74	40	1	87	59	89	60
2	83	38	79	38	2	82	55	87	60
3	87	38	80	41	3	85	50	88	55
4	83	45	80	47	4	76	62	97	59
5	82	45	75	48	5	81	56	83	57
6	78	43	71	50	6	83	56	92	60
7	63	46	62	46	7	87	55	92	57
8	68	44	66	44	8	88	57	89	58
9	84	38	78	38	9	91	55	97	57
10	82	42	80	43	10	100	60	101	60
11	86	47	82	44	11	99	63	107	67
12	88	51	85	45	12	100	64	108	71
13	96	52	91	46	13	99	66	105	71
14	89	51	85	51	14	97	65	99	66
15	76	46	72	51	15	90	65	90	62
16	71	54	64	51	16	88	62	94	64
17	74	52	71	53	17	88	62	95	63
18	84	54	78	51	18	89	62	92	63
19	73	49	72	49	19	92	64	98	64
20	81	45	77	49	20	97	65	103	64
21	79	44	77	45	21	96	64	101	63
22	66	50	67	51	22	89	60	91	60
23	71	49	73	52	23	83	54	85	56
24	78	47	75	41	24	80	56	85	58
25	83	53	82	46	25	82	56	83	57
26	85	60	84	51	26	86	55	95	55
27	91	56	91	49	27	89	58	93	58
28	77	59	76	52	28	93	70	92	58
29	74	54	72	51	29	93	73	90	58
30	84	54	78	51	30	94	61	91	57
					31	96	72	95	58
May									
1	85	47	81	46	1	77	38	75	45
2	91	60	86	49	2	83	56	84	51
3	91	57	89	60	3	85	59	84	55
4	97	57	95	50	4	83	55	84	55
5	93	51	92	58	5	83	61	90	55
6	88	53	85	53	6	81	60	83	60
7	82	47	81	49	7	86	54	87	54
8	84	47	84	46	8	91	60	96	58
9	81	44	77	51	9	90	52	92	58
10	74	54	72	52	10	80	56	83	58
11	77	60	77	49	11	81	49	87	52
12	77	55	77	51	12	82	50	85	54
13	85	45	85	46	13	77	55	80	53
14	84	50	79	49	14	77	49	83	54
15	85	45	83	48	15	80	51	80	55
16	83	49	83	48	16	77	52	81	54
17	78	55	76	50	17	81	50	83	54
18	72	48	70	48	18	81	51	87	53
19	66	52	67	49	19	93	57	96	56
20	66	45	64	54	20	95	58	100	64
21	76	55	74	55	21	96	59	104	63
22	74	50	74	56	22	87	60	81	58
23	71	49	69	51	23	85	53	87	56
24	73	44	72	48	24	84	57	88	58
25	77	46	76	49	25	85	51	91	55
26	71	52	71	54	26	85	50	89	53
27	64	49	64	49	27	87	53	88	58
28	75	46	73	56	28	87	55	95	56
29	75	55	73	56	29	86	59	87	61
30	68	51	63	53	30	89	55	94	58
31	71	44	69	49	31	89	66	92	58
June									
1	87	62	94	58	1	96	62	94	58
2	94	64	92	59	2	94	64	92	59
3	93	63	89	60	3	93	63	89	60
4	90	62	97	59	4	90	62	97	59
5	101	63	105	58	5	101	63	105	58
6	105	69	105	66	6	105	69	105	66
7	102	75	99	71	7	102	75	99	71
8	101	69	102	65	8	101	69	102	65
9	106	73	105	72	9	106	73	105	72
10	105	69	101	64	10	105	69	101	64
11	100	65	99	64	11	100	65	99	64
12	97	62	94	59	12	97	62	94	59
13	96	62	95	60	13	96	62	95	60
14	86	61	83	59	14	86	61	83	59
15	84	58	81	59	15	84	58	81	59
16	84	59	83	59	16	84	59	83	59
17	86	61	85	60	17	86	61	85	60
18	83	59	81	60	18	83	59	81	60
19	84	56	85	55	19	84	56	85	55
20	87	58	83	57	20	87	58	83	57
21	91	56	89	58	21	91	56	89	58
22	95	56	94	55	22	95	56	94	55
23	96	61	91	60	23	96	61	91	60
24	82	54	75	58	24	82	54	75	58
25	77	51	74	55	25	77	51	74	55
26	78	52	77	55	26	78	52	77	55
27	85	54	82	54	27	85	54	82	54
28	90	60	90	55	28	90	60	90	55
29	90	61	88	62	29	90	61	88	62
30	88	59	89	59	30	88	59	89	59
31	91	54	92	54	31	91	54	92	54
August									
1	92	55	94	58	1	92	55	94	58
2	92	55	92	52	2	92	55	92	52
3	90	55	87	56	3	90	55	87	56
4	90	53	88	55	4	90	53	88	55
5	93	53	92	55	5	93	53	92	55
6	90	56	91	57	6	90	56	91	57
7	90	55	94	55	7	90	55	94	55
8	89	54	93	51	8	89	54	93	51
9	94	51	95	52	9	94	51	95	52
10	95	56	94	53	10	95	56	94	53
11	88	55	91	56	11	88	55	91	56
12	88	56	90	54	12	88	56	90	54
13	85	51	84	52	13	85	51	84	52
14	81	57	83	55	14	81	57	83	55
15	82	54	82	53	15	82	54	82	53
16	85	47	88	49	16	85	47	88	49
17	87	51	89	53	17	87	51	89	53
18	85	53	83	55	18	85	53	83	55
19	97	53	90	52	19	97	53	90	52
20	98	60	92	55	20	98	60	92	55
21	98	64	87	65	21	98	64	87	65
22	85	61	85	62	22	85	61	85	62
23	84	60	79	54	23	84	60	79	54
24	82	57	81	54	24	82	57	81	54
25	78	59	77	58	25	78	59	77	58
26	82	55	79	51	26	82	55	79	51
27	88	55	86	53	27	88	55	86	53
28	97	51	91	51	28	97	51	91	51
29	98	58	95	54	29	98	58	95	54
30	99	59	99	54	30	99	59	99	54
September									
1	92	55	94	58	1	92	55	94	58
2	92	55	92	52	2	92	55	92	52
3	90	55	87	56	3	90	55	87	56
4	90	53	88	55	4	90	53	88	55
5	93	53	92	55	5	93	53	92	55
6	90	56	91	57	6	90	56	91	57
7	90	55	94	55	7	90	55	94	55
8	89	54	93	51	8	89	54	93	51
9	94	51	95	52	9	94	51	95	52
10	95	56	94	53	10	95	56	94	53
11	88	55	91	56	11	88	55	91	56
12	88	56	90	54	12	88	56	90	54
13	85	51	84	52	13	85	51	84	52
14	81	57	83	55	14	81	57	83	55
15	82	54	82	53	15	82	54	82	53
16	85	47	88	49	16	85	47	88	49

Table 3. Performance summary of the very early rice varieties and advanced breeding lines. Butte County, 1990.

Entry	Grain type ¹	Grain yield at 14% moisture (lbs/a)	Grain moisture at harvest (%)	Seedling vigor ² (1-5)	Days to 50% heading	Lodging ³ (1-99)	Plant height (inches)	
10	88Y165	M	11140	18.0	4.6	84	2	35.7
17	89Y375	L	10900	16.4	4.8	86	2	36.0
12	M-201	M	10740	21.0	4.8	93	8	37.4
16	88Y774	L	10690	17.6	4.7	88	1	35.0
3	VAL.87	S	10370	16.0	4.9	86	13	37.0
8	89Y124	S	10310	17.7	4.8	86	17	35.8
7	89Y115	S	10210	17.5	4.7	85	16	38.5
15	L-202	L	10010	18.0	4.7	91	1	33.7
11	88Y133	M	9700	18.1	4.8	84	24	39.2
5	87Y101	S	9300	17.2	4.7	85	38	37.9
6	87Y125	S	9270	16.0	5.0	84	43	38.4
13	M-202	M	9140	19.5	4.9	89	53	39.2
4	S-201	S	9030	20.9	5.0	99	4	39.2
1	S-101	S	8870	17.5	3.8	86	50	37.8
9	M-103	M	8750	17.3	4.8	83	51	38.5
2	CM-101	W	8200	18.1	4.9	81	70	38.1
14	M-203	M	7510	21.5	5.0	92	98	41.7
Mean			9660	18.1	4.8	87	29	37.6
CV			8.3	7.8	12.7	1.4	47.4	3.1
LSD (.05)			1140	2.0	NS	2	19	1.7

Location: Rice Experiment Station, Biggs.

Planting date: Replications 1 and 2, May 3, 1989

Replications 3 and 4, May 24, 1989

¹S = short; M = medium; L = long; W = waxy.

²Subjective rating of 1-5 where 1 = poor and 5 = excellent seedling emergence.

³Subjective rating of 1-99 where 1 = none and 99 = 99% lodged.

Table 4. Performance summary of the very early preliminary breeding lines. Butte County, 1990.

Entry	Grain type ¹	Grain yield at 14% moisture (lbs/a)	Grain moisture at harvest (%)	Seedling vigor ² (1-5)	Days to 50% heading	Lodging ³ (1-99)	Plant height (inches)	
21	89Y121	S	11140	16.5	4.8	94	3	36.8
34	89Y374	L	10880	15.8	4.4	94	1	35.8
30	89Y202	M	10580	16.8	4.8	94	1	38.6
33	89Y347	M	10530	18.5	5.0	94	15	41.1
35	89Y422	L	10410	17.6	4.5	94	1	40.0
26	89Y190	M	10400	17.4	4.8	91	15	35.6
18	89Y103	S	10400	17.9	4.8	93	20	37.2
28	89Y178	M	10090	17.5	4.7	94	4	37.4
23	89Y235	S	9990	16.0	4.8	91	10	39.2
25	88Y142	M	9930	19.0	4.8	97	43	38.4
20	89Y118	S	9840	17.0	4.8	91	28	37.2
43	90Y43	L	9670	15.9	4.7	93	1	34.1
32	89Y220	M	9640	17.9	4.8	97	26	37.8
39	90Y39	L	9570	16.3	4.7	94	1	37.0
31	89Y203	M	9440	19.0	4.8	96	30	37.6
38	90Y38	L	9230	15.4	4.7	94	18	37.8
41	90Y41	L	8980	15.0	4.7	85	1	33.3
29	89Y182	M	8980	17.5	5.0	94	25	38.4
36	90Y36	L	8860	15.1	4.6	93	6	35.8
24	89Y176	M	8840	16.2	4.8	91	35	40.3
27	89Y196	M	8810	15.8	4.7	87	50	36.8
19	89Y109	S	8790	18.1	4.8	93	35	39.4
22	89Y137	S	8420	17.6	4.6	89	65	40.3
37	90Y37	L	7590	16.1	4.6	94	78	41.5
42	90Y42	L	5960	14.9	4.7	82	16	34.3
40	90Y40	L	2920	17.6	4.6	81	1	32.3
Mean			9230	16.9	4.7	92	20	37.5
CV			6.7	3.9	1.4	0.7	86.2	3.2
LSD (.05)			1280	1.3	0.1	1	36	2.5

Location: Rice Experiment Station, Biggs
 Planting date: Replications 1 and 2, May 3, 1990
 Replications 3 and 4, May 25, 1990

¹S = short; M = medium; L = long; W = waxy.

²Subjective rating of 1-5 where 1 = poor and 5 = excellent seedling emergence.

³Subjective rating of 1-99 where 1 = none and 99 = 99% lodged.

Table 5. Performance summary of the very early rice varieties and advanced breeding lines. Butte County, 1990.

Entry	Grain type ¹	Grain yield at 14% moisture (lbs/a)	Grain moisture at harvest (%)	Days to 50% heading	Lodging ² (1-99)	Plant height (inches)
12 M-201	M	10630	16.6	92	32	38.7
16 88Y774	L	10370	15.9	82	1	36.2
10 88Y165	M	9570	15.4	85	22	35.0
8 89Y124	S	9540	16.3	87	20	33.5
3 VAL.87	S	9510	14.3	87	6	36.0
17 89Y375	L	9470	14.7	87	1	33.8
15 L-202	L	9470	16.3	95	1	33.7
11 88Y133	M	9390	14.4	85	20	36.0
7 89Y115	S	9310	18.3	87	43	38.4
13 M-202	M	9120	17.7	89	97	38.4
4 S-201	S	8960	19.9	96	45	39.5
5 87Y101	S	8920	15.9	85	94	35.3
6 87Y125	S	8580	14.1	85	71	37.1
1 S-101	S	8570	14.7	87	86	34.9
9 M-103	M	8080	16.5	83	98	36.0
2 CM-101	W	7790	15.9	84	97	35.8
14 M-203	M	7440	18.8	90	99	39.2
Mean		9100	16.2	87	49	36.3
CV		7.6	8.1	4.7	51.0	4.2
LSD (.05)		980	1.9	6	35	2.2

Location: Durham

Planting date: May 8, 1990

¹S = short; M = medium; L = long; W = waxy.

²Subjective rating of 1-99 where 1 = none and 99 = 99% lodged.

Table 6. Performance summary of the very early preliminary breeding lines. Butte County, 1990.

Entry	Grain type ¹	Grain yield at 14% moisture (lbs/a)	Grain moisture at harvest (%)	Days to 50% heading	Lodging ² (1-99)	Plant height (inches)	
25	88Y142	M	10110	17.2	91	73	33.7
34	89Y374	L	10070	14.7	89	5	35.6
30	89Y202	M	10060	18.4	90	52	39.2
26	89Y190	M	9770	14.9	86	23	37.6
27	89Y196	M	9680	14.6	86	50	37.4
20	89Y118	S	9380	16.5	85	13	37.6
35	89Y422	L	9380	17.2	92	3	39.2
32	89Y220	M	9170	16.3	90	43	35.0
29	89Y182	M	9130	15.4	89	63	36.4
41	90Y41	L	8990	14.1	80	1	33.1
43	90Y43	L	8900	15.1	88	1	32.9
39	90Y39	L	8790	17.3	94	33	40.5
31	89Y203	M	8790	19.8	89	41	38.8
24	89Y176	M	8750	15.8	86	70	37.8
28	89Y178	M	8700	15.4	90	15	39.4
33	89Y347	M	8680	17.4	90	97	39.8
21	89Y121	S	8660	17.1	90	45	40.0
36	90Y36	L	8560	14.4	88	25	34.0
23	89Y235	S	8480	16.7	87	58	39.4
19	89Y109	S	7850	17.7	89	99	40.9
18	89Y103	S	7820	18.0	89	99	37.2
38	90Y38	L	7640	18.4	92	80	39.0
42	90Y42	L	7520	15.0	75	36	34.8
22	89Y137	S	7300	16.1	84	87	39.2
37	90Y37	L	6850	17.1	89	99	37.6
40	90Y40	L	6340	13.4	75	70	35.6
Mean			8670	16.3	87	49	37.4
CV			9.3	8.2	1.3	59.7	5.0
LSD (.05)			1660	2.7	2	60	3.9

Location: Durham
Planting date: May 8, 1990

¹S = short; M = medium; L = long; W = waxy.

²Subjective rating of 1-99 where 1 = none and 99 = 99% lodged.

Table 7. Performance summary of the very early rice varieties and advanced breeding lines. Sutter County, 1990.

Entry	Grain type ¹	Grain yield at 14% moisture (lbs/a)	Grain moisture at harvest (%)	Seedling vigor ² (i-5)	Days to 50% heading	Lodging ³ (1-99)	Plant height (inches)
13 M-202	M	11920	19.5	4.0	97	2	37.8
12 M-201	M	11650	21.0	3.4	100	1	36.2
8 89Y124	S	11260	18.7	3.5	97	1	34.0
16 88Y774	L	11220	17.4	3.5	98	1	34.1
6 87Y125	S	10950	16.5	4.5	90	15	37.5
7 89Y115	S	10780	19.3	3.3	84	13	36.6
17 89Y375	L	10710	16.8	3.0	98	1	32.4
10 88Y165	M	10640	17.8	3.4	88	26	34.3
11 88Y133	M	10630	19.8	3.9	91	1	37.0
3 VAL.87	S	10590	16.4	4.3	95	1	36.0
2 CM-101	W	10380	17.4	3.9	89	41	37.0
14 M-203	M	10160	21.1	4.3	98	49	39.7
1 S-101	S	10150	16.8	3.3	95	34	35.0
4 S-201	S	10070	23.5	3.9	106	48	38.9
15 L-202	L	9970	18.0	3.3	101	1	32.5
5 87Y101	S	9940	17.9	4.5	90	10	35.4
9 M-103	M	9770	18.3	3.5	89	41	36.8
Mean		10630	18.6	3.7	94	17	36.0
CV		4.8	5.8	16.7	3.5	124.5	2.7
LSD (.05)		730	1.5	0.9	5	30	1.4

Location: Natomas

Planting date: April 27, 1990

¹S = short; M = medium; L = long; W = waxy.

²Subjective rating of 1-5 where 1 = poor and 5 = excellent seedling emergence.

³Subjective rating of 1-99 where 1 = none and 99 = 99% lodged.

Table 8. Performance summary of the very early preliminary breeding lines. Sutter County, 1990.

Entry	Grain type ¹	Grain yield at 14% moisture (lbs/a)	Grain moisture at harvest (%)	Seedling vigor ² (1-5)	Days to 50% heading	Lodging ³ (1-99)	Plant height (inches)	
26	89Y190	M	13130	17.9	3.5	96	20	35.2
33	89Y347	M	12390	18.4	4.0	97	5	38.6
25	88Y142	M	12030	20.3	3.3	96	1	36.0
18	89Y103	S	11570	17.0	3.5	95	8	36.4
28	89Y178	M	11560	18.4	3.5	96	1	37.6
21	89Y121	S	11460	17.2	3.3	96	3	37.8
35	89Y422	L	11160	18.5	3.0	96	1	36.8
24	89Y176	M	11020	17.8	4.3	92	1	38.2
34	89Y374	L	11000	16.8	3.8	98	1	33.3
30	89Y202	M	10920	18.5	4.0	96	1	36.2
27	89Y196	M	10460	16.0	3.8	93	6	35.2
19	89Y109	S	10340	19.8	3.5	97	43	38.2
36	90Y36	L	10330	14.9	2.5	96	1	32.1
32	89Y220	M	10280	14.9	3.5	96	1	34.5
41	90Y41	L	10270	15.3	4.5	88	1	32.7
29	89Y182	M	10040	22.1	4.3	96	1	37.4
20	89Y118	S	9990	20.6	3.8	90	1	35.4
22	89Y137	S	9960	17.5	4.3	89	1	39.2
43	90Y43	L	9720	18.2	2.8	96	1	31.9
38	90Y38	L	9690	16.5	3.3	96	1	35.8
39	90Y39	L	9630	15.5	2.8	97	1	34.8
31	89Y203	M	9470	24.0	3.8	98	1	35.4
42	90Y42	L	8780	16.3	4.5	88	1	34.3
37	90Y37	L	8690	16.9	3.8	97	68	41.5
23	89Y235	S	8620	16.7	4.5	90	1	37.0
40	90Y40	L	5790	15.3	4.0	88	1	31.3
Mean			10320	17.7	3.7	94	7	35.9
CV			10.8	7.8	11.3	2.9	33.6	2.6
LSD (.05)			2300	2.8	0.9	NS	5	1.9

Location: Natomas

Planting date: April 27, 1990

¹S = short; M = medium; L = long; W = waxy.

²Subjective rating of 1-5 where 1 = poor and 5 = excellent seedling emergence.

³Subjective rating of 1-99 where 1 = none and 99 = 99% lodged.

Table 9. Performance summary of the very early rice varieties and advanced breeding lines. San Joaquin County, 1990.

Entry	Grain type ¹	Grain yield at 14% moisture (lbs/a)	Grain moisture at harvest (%)	Seedling vigor ² (1-5)	Days to 50% heading	Lodging ³ (1-99)	Plant height (inches)
2 CM-101	W	9520	13.8	4.1	93	33	34.9
6 87Y125	S	9520	12.8	4.5	96	14	33.1
16 88Y774	L	9420	15.6	3.5	103	1	31.9
9 M-103	M	9380	14.1	4.4	93	12	32.2
3 VAL.87	S	9350	12.8	4.4	95	1	34.2
13 M-202	M	9320	15.4	4.4	100	10	34.7
5 87Y101	S	9180	13.0	3.8	95	30	33.8
1 S-101	S	9150	13.7	4.3	97	30	32.0
12 M-201	M	9120	20.2	4.3	104	1	34.7
8 89Y124	S	8910	16.3	4.3	98	1	30.0
11 88Y133	M	8890	17.0	4.4	94	1	33.3
17 89Y375.	L	8760	15.1	4.3	103	1	30.3
7 89Y115	S	8480	17.4	4.4	94	1	33.8
15 L-202	M	8310	17.0	4.3	104	1	29.2
14 M-203	M	8260	12.1	4.3	97	99	35.8
4 S-201	S	8170	17.1	4.5	105	17	33.2
10 88Y165	M	7810	15.3	3.8	94	13	33.8
Mean		8920	15.2	4.2	98	16	33.0
CV		7.9	3.9	9.4	1.9	103.6	6.0
LSD (.05)		1000	0.8	0.6	3	23	2.8

Location: Valley Home

Planting date: May 11, 1990

¹S = short; M = medium; L = long; W = waxy.

²Subjective rating of 1-5 where 1 = poor and 5 = excellent seedling emergence.

³Subjective rating of 1-99 where 1 = none and 99 = 99% lodged.

Table 10. Performance summary of the very early preliminary breeding lines. San Joaquin County, 1990.

Entry	Grain type ¹	Grain yield at 14% moisture (lbs/a)	Grain moisture at harvest (%)	Seedling vigor ² (1-5)	Days to 50% heading	Lodging ³ (1-99)	Plant height (inches)
33 89Y347	M	9430	15.3	4.5	96	36	35.8
27 89Y196	M	9380	13.9	4.5	95	1	32.1
20 89Y118	S	9150	18.5	4.3	94	1	33.5
26 89Y190	M	9100	14.4	4.8	93	23	32.3
41 90Y41	L	8820	14.4	4.5	90	1	30.9
24 89Y176	M	8730	14.3	4.3	96	3	32.5
31 89Y203	M	8700	17.5	4.5	96	1	31.1
22 89Y137	S	8640	18.4	3.5	94	1	36.4
25 88Y142	M	8630	13.6	4.3	99	16	31.9
18 89Y103	S	8570	14.6	4.0	101	1	28.5
32 89Y220	M	8560	15.3	4.5	95	1	31.9
28 89Y178	M	8430	16.6	4.3	98	1	30.7
34 89Y374	L	8400	14.9	4.5	102	1	30.1
30 89Y202	M	8300	16.9	4.5	97	1	34.5
21 89Y121	S	8280	16.9	4.3	97	1	30.9
19 89Y109	S	8220	17.5	4.3	101	1	33.1
29 89Y182	M	8120	14.7	4.8	96	1	32.7
23 89Y235	S	8070	15.8	4.3	98	1	32.5
40 90Y40	L	7780	12.8	4.0	89	41	26.2
38 90Y38	L	7720	13.9	4.3	100	1	27.6
39 90Y39	L	7680	14.6	4.3	96	1	29.9
42 90Y42	L	7570	13.9	4.3	90	1	25.6
37 90Y37	L	7460	13.5	4.5	99	8	32.1
35 89Y422	L	7300	16.5	3.8	104	1	31.9
43 90Y43	L	6530	15.4	3.8	103	1	27.0
36 90Y36	L	6380	14.7	4.3	107	1	27.6
Mean		8230	15.3	4.3	97	6	31.1
CV		5.4	4.4	8.6	2.4	296.2	5.8
LSD (.05)		910	1.4	NS	4	NS	3.7

Location: Valley Home
 Planting date: May 11, 1990

¹S = short; M = medium; L = long; W = waxy.

²Subjective rating of 1-5 where 1 = poor and 5 = excellent seedling emergence.

³Subjective rating of 1-99 where 1 = none and 99 = 99% lodged.

Table 11. Performance of the very early rice varieties and advanced breeding lines, four-location summary (Biggs, Butte, Sutter, and San Joaquin counties).

Entry	Grain type ¹	Grain yield at 14% moisture (lbs/a)	Grain moisture at harvest (%)	Seedling vigor ^{2,4} (1-5)	Days to 50% heading	Lodging ³ (1-99)	Plant height (inches)
12 M-201	M	10530	19.7	4.1	97	10	36.7
16 88Y774	L	10430	16.6	3.9	92	1	34.3
8 89Y124	S	10010	17.3	4.2	92	10	33.3
17 89Y375	L	9960	15.7	4.0	94	1	33.1
3 VAL.87	S	9950	14.9	4.5	91	5	35.8
13 M-202	M	9880	18.0	4.4	94	40	37.5
10 88Y165	M	9790	16.6	3.9	88	16	34.7
7 89Y115	S	9690	18.1	4.1	87	18	36.8
11 88Y133	M	9650	17.3	4.4	88	11	36.4
6 87Y125	S	9580	14.9	4.7	89	36	36.5
15 L-202	L	9440	17.3	4.1	98	1	32.3
5 87Y101	S	9330	16.0	4.3	89	43	35.6
1 S-101	S	9180	15.7	3.8	91	50	34.9
4 S-201	S	9060	20.3	4.4	102	28	37.7
9 M-103	M	9000	16.5	4.2	87	51	35.9
2 CM-101	W	8970	16.3	4.3	87	60	36.5
14 M-203	M	8340	18.4	4.5	94	86	39.1
Mean		9580	17.0	4.2	92	27	35.7
CV		7.1	6.7	13.0	3.1	70.5	4.1
LSD (.05)		480	0.8	0.4	2	14	1.0

¹S = short; M = medium; L = long; W = waxy.

²Subjective rating of 1-5 where 1 = poor and 5 = excellent seedling emergence.

³Subjective rating of 1-99 where 1 = none and 99 = completely lodged.

⁴Seedling vigor is at three locations only--does not include Butte county.

Table 12. Performance of the very early preliminary breeding lines four-location summary (Biggs, Butte, Sutter, and San Joaquin counties).

Entry	Grain type ¹	Grain yield at 14% moisture (lbs/a)	Grain moisture at harvest (%)	Seedling vigor ^{2,4} (1-5)	Days to 50% heading	Lodging ³ (1-99)	Plant height (inches)	
26	89Y190	M	10600	16.1	4.3	91	20	35.2
33	89Y347	M	10260	17.4	4.5	94	38	38.8
25	88Y142	M	10170	17.5	4.1	94	33	35.0
34	89Y374	L	10090	15.6	4.2	93	2	33.7
30	89Y202	M	9970	17.6	4.4	93	14	37.1
21	89Y121	S	9880	16.9	4.1	93	13	36.4
28	89Y178	M	9700	17.0	4.2	93	5	36.3
20	89Y118	S	9590	18.1	4.3	89	11	35.9
18	89Y103	S	9590	16.9	4.1	92	32	34.8
27	89Y196	M	9580	15.1	4.3	88	27	35.4
35	89Y422	L	9560	17.5	3.8	94	2	37.0
32	89Y220	M	9410	16.1	4.3	94	18	34.8
24	89Y176	M	9340	16.0	4.4	90	27	37.2
41	90Y41	L	9270	14.7	4.6	84	1	32.5
31	89Y203	M	9100	20.1	4.3	94	18	35.7
29	89Y182	M	9070	17.4	4.7	93	22	36.2
39	90Y39	L	8920	15.9	3.9	95	9	35.6
19	89Y109	S	8800	18.3	4.2	93	44	37.9
23	89Y235	S	8790	16.3	4.5	89	17	37.0
43	90Y43	L	8710	16.1	3.7	92	1	31.5
22	89Y137	S	8580	17.4	4.2	87	39	38.8
38	90Y38	L	8570	16.0	4.1	94	25	35.0
36	90Y36	L	8530	14.8	3.8	92	8	32.4
37	90Y37	L	7650	15.9	4.3	93	63	38.2
42	90Y42	L	7460	15.0	4.5	82	13	32.2
40	90Y40	L	5710	14.8	4.2	81	28	31.4
Mean			9110	16.6	4.2	91	20	35.5
CV			8.6	6.5	7.6	3.0	93.3	4.3
LSD (.05)			780	1.1	0.4	8	19	1.5

¹S = short; M = medium; L = long; W = waxy.

²Subjective rating of 1-5 where 1 = poor and 5 = excellent seedling emergence.

³Subjective rating of 1-99 where 1 = none and 99 = completely lodged.

⁴Seedling vigor is at three locations only--does not include Butte county.

Table 13. Grain yield summary of the very early advanced lines and varieties by locations and years.

Location	Year	S-101	M-103	M-202	Calmochi-101	L-203 (88-Y-774)
Butte	1986	9780	9110	9510	9490	
	1987	9990	10210	9510	10350	
	1988	9520	8890	9430	9160	10650
	1989	8410	9250	9980	8220	9460
	1990	8570	8080	9120	7790	10690
	<i>Loc. mean</i>		9250	9110	9510	9000
Sacramento	1986	11380	10580	11770	10600	
	1987	9700	9000	9270	8940	
	1988	7760	6820	8320	7660	
	1989	10620	10930	12300	11060	12050
	1990	10150	9770	11920	10380	11220
	<i>Loc. mean</i>		9920	9420	10720	9730
San Joaquin	1986	7300	9220	9670	10950	
	1987	7980	9690	8100	10240	
	1988	7280	6820	7560	7300	
	1989	7050	9370	6880	9290	7900
	1990	9150	9380	9260	9520	9420
	<i>Loc. mean</i>		7750	8900	8290	9460
<i>Loc.-years mean</i>		8980	9140	9510	9400	10200
Yield % M-103		98	--	104	103	109
Number of tests		15	15	15	15	7

Table 14. Performance summary of the early rice varieties and advanced breeding lines. Butte County, 1990.

Entry	Grain type ¹	Grain yield at 14% moisture (lbs/a)	Grain moisture at harvest (%)	Seedling vigor ² (1-5)	Days to 50% heading	Lodging ³ (1-99)	Plant height (inches)
65 88Y230	M	10980	19.2	4.8	90	14	37.9
63 88Y271	M	10840	21.1	4.8	95	3	38.6
68 88Y774	L	10700	17.7	4.6	90	2	37.0
58 89Y238	S	10660	19.3	4.9	96	9	40.5
56 88Y240	S	10490	19.4	4.8	93	8	38.4
67 L-202	L	10230	17.3	4.8	92	1	34.7
64 88Y317	M	10200	19.1	4.8	92	14	38.8
70 90Y70	L	10130	17.8	4.7	96	2	36.6
60 M-201	M	9920	20.5	4.8	94	15	38.6
57 87Y238	S	9920	20.5	4.9	97	21	39.9
66 86Y324	M	9440	21.4	4.8	93	30	41.1
53 VAL.87	S	9390	16.6	4.8	88	33	35.9
69 88Y772	L	9260	16.4	4.7	91	9	36.2
55 87Y38	S	9160	20.0	4.9	94	29	39.9
59 M-103	M	8960	18.0	4.7	84	84	37.1
54 S-201	S	8900	21.2	4.9	101	16	39.9
61 M-202	M	8790	19.0	4.9	90	95	40.1
51 S-101	S	8270	16.9	5.0	87	88	39.2
52 CM-101	W	7670	17.5	4.9	83	80	37.7
62 M-203	M	7000	19.4	4.9	92	99	41.7
Mean		9540	18.9	4.8	92	32	38.5
CV		7.3	6.7	1.0	1.2	35.2	3.0
LSD (.05)		990	1.8	0.1	2	16	1.7

Location: Rice Experiment Station, Biggs
 Planting date: Replications 1 and 2, May 3, 1990
 Replications 3 and 4, May 23, 1990

¹S = short; M = medium; L = long; W = waxy.

²Subjective rating of 1-5 where 1 = poor and 5 = excellent seedling emergence.

³Subjective rating of 1-99 where 1 = none and 99 = 99% lodged.

Table 15. Performance summary of the early preliminary breeding lines. Butte County, 1990.

Entry	Grain type ¹	Grain yield at 14% moisture (lbs/a)	Grain moisture at harvest (%)	Seedling vigor ² (1-5)	Days to 50% heading	Lodging ³ (1-99)	Plant height (inches)
82 90Y82	M	11500	16.4	4.8	91	5	34.5
77 89Y206	M	10630	17.3	4.8	98	28	39.4
78 89Y292	M	10600	18.6	4.8	100	13	37.8
84 89Y442	L	10530	17.5	4.6	101	2	37.6
89 90Y89	L	9470	18.1	5.0	105	10	40.8
76 89Y115	S	9430	17.8	4.7	94	78	38.0
73 89Y246	S	9380	21.9	4.9	104	90	40.9
74 89Y242	S	9230	18.2	4.8	95	70	36.2
90 90Y90	L	9180	16.0	4.6	97	38	38.8
75 89Y768	S	9120	22.1	4.8	102	88	41.5
85 89Y484	L	9070	14.9	4.8	97	8	40.5
72 89Y239	S	8940	17.9	4.8	99	80	37.6
83 89Y411	L	8920	17.8	4.8	100	50	42.3
86 90Y86	L	8760	15.2	4.4	98	1	38.0
79 89Y309	M	8720	20.4	4.9	97	33	41.1
81 89Y366	M	8470	18.9	5.0	96	88	40.2
71 89Y258	S	8260	25.9	4.8	100	93	40.2
87 90Y87	L	8190	17.8	4.7	102	10	41.7
80 89Y313	M	7880	20.2	5.0	98	80	40.3
88 90Y88	L	7430	19.0	4.9	100	85	40.5
Mean		9190	18.6	4.8	99	47	39.4
CV		7.5	10.0	1.2	1.6	24.3	3.0
LSD (.05)		1440	3.9	0.1	NS	24	2.5

Location: Rice Experiment Station, Biggs
 Planting date: Replications 1 and 2, May 3, 1990
 Replications 3 and 4, May 23, 1990

¹S = short; M = medium; L = long; W = waxy.

²Subjective rating of 1-5 where 1 = poor and 5 = excellent seedling emergence.

³Subjective rating of 1-99 where 1 = none and 99 = 99% lodged.

Table 16. Performance summary of the early rice varieties and advanced breeding lines. Merced County, 1990.

Entry	Grain type ¹	Grain yield at 14% moisture (lbs/a)	Grain moisture at harvest (%)	Seedling vigor ² (1-5)	Days to 50% heading	Lodging ³ (1-99)	Plant height (inches)	
64	88Y317	M	9250	21.6	4.3	91	7	33
60	M-201	M	8790	19.6	4.1	91	1	32
63	88Y271	M	8090	20.2	4.4	92	13	33
67	L-202	L	7750	19.9	3.7	94	1	30
66	86Y324	M	7680	20.1	4.1	91	3	32
65	88Y230	M	7670	19.7	4.0	90	1	33
55	87Y38	S	7490	23.3	4.1	91	28	33
62	M-203	M	7420	21.3	4.0	92	29	33
54	S-201	S	7410	21.1	4.3	94	32	32
51	S-101	S	7290	16.8	3.9	88	1	30
58	89Y238	S	7240	22.3	4.3	94	1	32
57	87Y238	S	7210	22.2	4.6	93	32	33
56	88Y240	S	7190	22.3	4.4	92	1	32
53	VAL.87	S	6820	17.5	4.5	89	1	29
69	88Y772	L	6790	18.5	4.4	90	1	30
61	M-202	M	6780	18.3	4.0	90	1	31
68	88Y774	L	6770	19.2	3.9	90	1	34
59	M-103	M	6670	18.9	3.6	88	6	30
70	90Y70	L	6450	19.6	4.1	95	1	30
52	CM-101	W	5530	17.9	4.4	88	2	31
Mean			7310	20.0	4.1	91	8	31
CV			12.1	6.6	9.8	1.2	208.9	7.4
LSD (.05)			1250	1.9	0.6	2	24	NS

Location: Rieke Ranch
 Planting date: May 9, 1990

¹S = short; M = medium; L = long; W = waxy.

²Subjective rating of 1-5 where 1 = poor and 5 = excellent seedling emergence.

³Subjective rating of 1-99 where 1 = none and 99 = 99% lodged.

Table 17. Performance summary of the early preliminary breeding lines. Merced County, 1990.

Entry	Grain type ¹	Grain yield at 14% moisture (lbs/a)	Grain moisture at harvest (%)	Seedling vigor ² (1-5)	Days to 50% heading	Lodging ³ (1-99)	Plant height (inches)
78 89Y292	M	9350	19.3	4.0	90	1	32
83 89Y411	L	9220	18.8	3.3	93	1	37
71 89Y258	S	8920	22.0	3.0	94	65	37
76 89Y115	S	8460	19.0	3.3	89	1	36
85 89Y484	L	8430	17.6	2.5	94	3	38
73 89Y246	S	8320	19.1	4.5	92	28	32
77 89Y206	M	8110	19.0	3.5	91	1	36
74 89Y242	S	8040	20.3	4.3	89	1	32
82 90Y82	M	8010	17.8	4.0	88	1	30
84 89Y442	L	7990	19.6	3.3	97	1	33
80 89Y313	M	7920	20.0	3.8	89	25	35
90 90Y90	L	7830	16.3	3.8	89	1	31
88 90Y88	L	7570	17.7	3.8	90	3	35
79 89Y309	M	7550	19.9	3.8	91	1	37
87 90Y87	L	7530	18.8	3.5	95	11	37
81 89Y366	M	7520	22.0	4.0	91	83	37
75 89Y768	S	7440	20.5	3.3	93	82	37
72 89Y239	S	7420	19.6	3.3	89	8	33
89 90Y89	L	6830	18.4	3.3	91	1	34
86 90Y86	L	6620	17.4	3.5	91	1	33
Mean		7960	19.2	3.6	91	16	34
CV		11.9	7.3	20.1	3.0	76.4	5.2
LSD (.05)		NS	2.9	NS	NS	25	4

Location: Rieke Ranch

Planting date: May 9, 1990

¹S = short; M = medium; L = long; W = waxy.

²Subjective rating of 1-5 where 1 = poor and 5 = excellent seedling emergence.

³Subjective rating of 1-99 where 1 = none and 99 = 99% lodged.

Table 18. Performance summary of the early rice varieties and advanced breeding lines. Yolo County, 1990.

Entry	Grain type ¹	Grain yield at 14% moisture (lbs/a)	Grain moisture at harvest (%)	Days to 50% heading	Lodging ² (1-99)	Plant height (inches)
53 VAL.87	S	11490	13.1	91	82	46.7
58 89Y238	S	10160	15.8	97	98	43.5
70 90Y70	L	10120	14.1	104	24	43.0
65 88Y230	M	10090	15.3	94	80	42.0
68 88Y774	L	9750	13.5	94	83	41.9
61 M-202	M	9640	13.7	93	99	45.1
56 88Y240	S	9540	15.4	101	98	43.6
64 88Y317	M	9500	12.9	99	95	43.7
52 CM-101	W	9490	14.5	91	96	44.4
60 M-201	M	9300	16.9	100	78	44.5
67 L-202	L	9210	13.7	100	85	41.7
55 87Y38	S	9080	13.2	96	99	44.8
59 M-103	M	9020	15.7	91	95	44.5
69 88Y772	L	8970	14.8	98	92	41.1
63 88Y271	M	8930	12.1	100	91	44.6
51 S-101	S	8750	10.9	95	99	45.6
66 86Y324	M	8710	13.6	101	99	47.4
57 87Y238	S	8170	13.0	100	99	44.1
54 S-201	S	7970	12.9	103	97	44.7
62 M-203	M	6830	12.5	95	99	48.1
Mean		9240	13.9	97	89	44.3
CV		7.3	7.7	2.3	7.1	3.3
LSD (.05)		960	1.5	3	9	2.1

Location: District 108
Planting date: May 9, 1990

¹S = short; M = medium; L = long; W = waxy.

²Subjective rating of 1-99 where 1 = none and 99 = 99% lodged.

Table 19. Performance summary of the early preliminary breeding lines.
Yolo County, 1990.

Entry	Grain type ¹	Grain yield at 14% moisture (lbs/a)	Grain moisture at harvest (%)	Days to 50% heading	Lodging ² (1-99)	Plant height (inches)	
82	90Y82	M	11320	13.9	91	48	46.7
78	89Y292	M	10060	13.0	96	87	44.7
79	89Y309	M	9480	15.6	97	92	46.8
72	89Y239	S	9230	13.8	99	99	41.7
85	89Y484	L	9120	14.0	100	85	45.1
76	89Y115	S	9070	17.0	93	95	41.5
90	90Y90	L	9040	14.0	91	95	44.9
84	89Y442	L	8970	13.2	103	90	43.3
86	90Y86	L	8960	12.9	105	35	44.1
71	89Y258	S	8850	12.9	100	99	45.5
89	90Y89	L	8640	13.6	105	85	42.1
77	89Y206	M	8530	12.9	95	95	46.7
87	90Y87	L	8490	13.9	103	40	46.8
73	89Y246	S	8490	12.9	103	99	43.3
83	89Y411	L	8460	14.4	102	97	45.9
75	89Y768	S	8450	12.9	102	97	46.7
88	90Y88	L	8200	13.5	92	96	46.8
81	89Y366	M	8120	13.0	97	99	46.7
74	89Y242	S	8110	14.8	96	99	45.9
80	89Y313	M	7810	11.6	94	99	46.3
Mean			8870	13.7	98	86	45.1
CV			9.3	6.6	2.0	11.0	5.8
LSD (.05)			NS	1.9	4	20	NS

Location: District 108

Planting date: May 9, 1990

¹S = short; M = medium; L = long; W = waxy.

²Subjective rating of 1-99 where 1 = none and 99 = 99% lodged.

Table 20. Performance summary of the early rice varieties and advanced breeding lines. Colusa County, 1990.

Entry	Grain type ¹	Grain yield	Grain	Days to	Lodging ²	Plant height
		at 14% moisture	moisture at harvest	50% heading		
		(lbs/a)	(%)		(1-99)	(inches)
53 VAL.87	S	9310	14.5	97	21	39.9
68 88Y774	L	9220	15.4	103	50	40.3
63 88Y271	M	9160	18.0	105	6	41.4
58 89Y238	S	9080	18.2	100	40	39.2
67 L-202	L	8780	16.5	109	1	36.1
64 88Y317	M	8760	16.4	102	55	39.4
56 88Y240	S	8740	19.4	97	35	40.9
57 87Y238	S	8730	17.3	99	86	42.2
65 88Y230	M	8680	15.8	97	10	37.4
66 86Y324	M	8560	18.1	102	80	42.3
70 90Y70	L	8550	18.4	112	1	39.9
60 M-201	M	8530	18.5	102	34	39.6
54 S-201	S	7810	17.8	100	95	42.7
55 87Y38	S	7720	18.5	98	90	41.2
51 S-101	S	7590	14.1	95	95	41.3
61 M-202	M	7430	16.1	97	86	40.9
69 88Y772	L	7420	16.4	110	4	36.8
52 CM-101	W	7300	16.7	96	92	41.5
59 M-103	M	7100	15.4	95	70	37.9
62 M-203	M	6050	13.6	97	99	41.6
Mean		8230	16.8	101	53	40.1
CV		7.0	4.9	1.6	27.0	3.9
LSD (.05)		820	1.2	2	20	2.2

Location: Lovelace Ranch
 Planting date: May 4, 1990

¹S = short; M = medium; L = long; W = waxy.

²Subjective rating of 1-99 where 1 = none and 99 = 99% lodged.

Table 21. Performance summary of the early preliminary breeding lines. Colusa County, 1990.

Entry	Grain type ¹	Grain yield at 14% moisture (lbs/a)	Grain moisture at harvest (%)	Days to 50% heading	Lodging ² (1-99)	Plant height (inches)	
82	90Y82	M	9750	15.3	98	3	41.7
77	89Y206	M	8940	21.0	102	50	41.9
85	89Y484	L	8920	15.6	111	8	42.1
83	89Y411	L	8800	18.7	100	5	42.5
87	90Y87	L	8710	15.8	113	1	43.7
75	89Y768	S	8630	15.3	101	95	43.7
86	90Y86	L	8520	19.5	99	1	43.3
84	89Y442	L	8360	17.4	109	1	38.4
72	89Y239	S	8280	18.1	98	80	40.0
73	89Y246	S	8230	16.9	106	68	40.5
89	90Y89	L	8200	16.1	109	38	41.5
79	89Y309	M	8100	17.2	97	40	40.3
74	89Y242	S	7980	23.7	99	88	41.7
80	89Y313	M	7850	17.7	97	97	42.5
71	89Y258	S	7710	24.7	104	78	41.1
78	89Y292	M	7710	15.4	100	60	38.8
88	90Y88	L	7660	17.9	108	45	47.6
90	90Y90	L	7630	16.4	106	78	40.5
81	89Y366	M	7100	17.4	98	97	42.7
76	89Y115	S	6500	20.1	96	30	40.5
Mean			8180	18.0	103	48	41.8
CV			8.9	9.3	1.6	24.7	5.3
LSD (.05)			1520	3.5	3	25	NS

Location: Loveface Ranch
Planting date: May 4, 1990

¹S = short; M = medium; L = long; W = waxy.

²Subjective rating of 1-99 where 1 = none and 99 = 99% lodged.

Table 22. Performance summary of the early rice varieties and advanced breeding lines. Yuba County, 1990.

Entry	Grain type ¹	Grain yield	Grain	Seedling	Days to	Lodging ³	Plant height	
		at 14% moisture	moisture at harvest	vigor ²	50% heading			
		(lbs/a)	(%)	(1-5)		(1-99)	(inches)	
63	88Y271	M	10370	20.9	3.9	100	1	37.7
64	88Y317	M	10160	20.5	3.3	98	1	37.3
65	88Y230	M	9840	18.6	3.5	96	1	35.8
58	89Y238	S	9750	20.8	3.8	99	1	39.3
68	88Y774	L	9740	17.0	3.1	90	1	36.1
60	M-201	M	9500	21.2	3.9	99	1	38.6
66	86Y324	M	9410	20.7	3.9	99	1	39.7
53	VAL.87	S	9130	13.9	4.1	89	1	35.0
57	87Y238	S	9060	21.8	4.4	101	8	39.5
61	M-202	M	8940	19.4	4.8	96	47	39.2
67	L-202	L	8770	16.9	3.0	98	1	33.4
54	S-201	S	8630	21.4	4.0	101	13	40.2
59	M-103	M	8450	18.4	3.3	89	79	37.6
69	88Y772	L	8450	16.1	2.8	98	1	35.5
56	88Y240	S	8310	21.0	3.5	98	1	37.9
70	90Y70	L	8240	17.9	2.9	100	2	36.2
55	87Y38	S	7860	23.7	3.9	98	8	37.4
51	S-101	S	7850	16.8	3.9	90	46	37.3
52	CM-101	W	7710	15.6	4.0	89	69	37.3
62	M-203	M	7620	22.3	4.1	97	98	41.9
Mean			8890	19.2	3.7	96	19	37.6
CV			9.9	10.4	9.2	4.0	82.5	3.1
LSD (.05)			1240	2.8	0.5	5	22	1.6

Location: District 10
 Planting date: April 26, 1990

¹S = short; M = medium; L = long; W = waxy.

²Subjective rating of 1-5 where 1 = poor and 5 = excellent seedling emergence.

³Subjective rating of 1-99 where 1 = none and 99 = 99% lodged.

Table 23. Performance summary of the early preliminary breeding lines. Yuba County, 1990.

Entry	Grain type ¹	Grain yield at 14% moisture (lbs/a)	Grain moisture at harvest (%)	Seedling vigor ² (1-5)	Days to 50% heading	Lodging ³ (1-99)	Plant height (inches)
82 90Y82	M	10510	17.1	3.3	92	1	33.1
72 89Y239	S	9990	19.8	4.0	99	8	36.8
77 89Y206	M	9950	19.0	3.8	99	1	38.4
74 89Y242	S	9880	21.1	3.5	98	1	39.2
78 89Y292	M	9860	19.9	3.3	100	1	38.0
71 89Y258	S	9620	21.4	3.3	99	1	38.8
84 89Y442	L	9520	18.1	2.8	102	1	36.0
73 89Y246	S	9430	21.6	4.0	101	40	37.2
83 89Y411	L	9430	17.8	3.3	99	1	40.3
79 89Y309	M	9380	19.8	4.5	98	1	38.4
75 89Y768	S	9270	19.6	4.0	98	23	39.6
85 89Y484	L	9150	15.6	3.5	100	1	40.8
80 89Y313	M	9120	19.3	4.3	97	33	37.6
76 89Y115	S	8960	18.8	3.0	90	3	37.8
86 90Y86	L	8820	12.9	3.8	99	1	35.4
87 90Y87	L	8680	17.4	3.5	101	1	39.8
90 90Y90	L	8670	14.6	3.5	91	1	36.2
88 90Y88	L	8440	16.6	3.5	96	35	39.6
89 90Y89	L	8440	17.6	4.0	102	1	35.8
81 89Y366	M	8330	20.3	4.0	98	65	39.0
Mean		9270	18.4	3.6	98	11	37.9
CV		5.1	4.5	12.0	2.2	66.0	2.1
LSD (.05)		990	1.7	0.9	NS	15	1.7

Location: District 10

Planting date: April 26, 1990

¹S = short; M = medium; L = long; W = waxy.

²Subjective rating of 1-5 where 1 = poor and 5 = excellent seedling emergence.

³Subjective rating of 1-99 where 1 = none and 99 = 99% lodged.

Table 24. Performance of the early rice varieties and advanced breeding lines, five-location summary (Butte, Merced, Yolo, Colusa, and Yuba counties).

Entry	Grain type ¹	Grain yield at 14% moisture (lbs/a)	Grain moisture at harvest (%)	Seedling vigor ^{2,4} (1-5)	Days to 50% heading	Lodging ³ (1-99)	Plant height (inches)	
64	88Y317	M	9570	18.1	4.1	96	34	38.3
63	88Y271	M	9480	18.5	4.3	98	23	39.0
65	88Y230	M	9450	17.7	4.1	93	21	37.2
58	89Y238	S	9380	19.3	4.3	97	30	38.9
68	88Y774	L	9240	16.5	3.9	93	27	37.8
53	VAL.87	S	9230	15.1	4.5	91	27	37.3
60	M-201	M	9210	19.3	4.3	97	26	38.7
67	L-202	L	8950	16.9	3.8	99	18	35.2
56	88Y240	S	8850	19.5	4.2	96	29	38.6
66	86Y324	M	8760	18.8	4.3	97	43	40.5
70	90Y70	L	8700	17.6	3.9	101	6	37.2
57	87Y238	S	8620	18.9	4.7	98	49	39.7
61	M-202	M	8310	17.3	4.6	93	65	39.3
55	87Y38	S	8260	19.7	4.3	95	51	39.2
69	88Y772	L	8180	16.4	3.9	97	21	35.9
54	S-201	S	8140	18.9	4.4	100	51	39.8
59	M-103	M	8040	17.3	3.9	90	67	37.3
51	S-101	S	7950	15.1	4.2	91	66	38.6
52	CM-101	W	7540	16.4	4.4	89	68	38.3
62	M-203	M	6990	17.8	4.4	94	85	41.6
Mean		8640	17.8	4.2	95	40	38.4	
CV		8.7	7.6	7.3	2.3	33.4	4.2	
LSD (.05)		470	0.8	0.2	1	8	1.0	

¹S = short; M = medium; L = long; W = waxy.

²Subjective rating of 1-5 where 1 = poor and 5 = excellent seedling emergence.

³Subjective rating of 1-99 where 1 = none and 99 = completely lodged.

⁴Seedling vigor is at three locations only--does not include Yolo and Colusa counties.

Table 26. Grain yield summary of the early advanced lines and varieties by location and year.

Location	Year	S-201	M-201	L-202	M-202	M-203
Butte	1986	10490	10390	10130	10270	8690
	1987	9590	8640	9760	9720	8330
	1988	9830	10740	9980	9350	7990
	1989	8820	9540	9050	9530	7410
	1990	8900	9920	10230	8790	7000
<i>Loc. mean</i>		<i>9530</i>	<i>9850</i>	<i>9830</i>	<i>9530</i>	<i>7880</i>
Colusa/Glenn	1986	8460	8430	7900	9530	7500
	1987	11080	7320	9980	10880	9510
	1988	6990	9710	8860	8190	6130
	1989	9540	9640	8300	9900	8410
	1990	7810	8530	8780	7430	6050
<i>Loc. mean</i>		<i>8780</i>	<i>8730</i>	<i>8760</i>	<i>9190</i>	<i>7520</i>
Yolo	1986	9690	9120	9600	10150	8440
	1987	10820	11220	10530	12050	9980
	1988	8300	8140	8830	7990	7190
	1989	8360	9170	8990	9600	9670
	1990	7970	9300	9210	9640	6830
<i>Loc. mean</i>		<i>9030</i>	<i>9390</i>	<i>9430</i>	<i>9890</i>	<i>8420</i>
Yuba	1986	9710	8960	6800	10100	9940
	1987	6850	4360	7760	7140	5870
	1988	8170	9490	9120	8480	6490
	1989	9560	9640	8960	8960	5520
	1990	8630	9500	8770	8940	7620
<i>Loc. mean</i>		<i>8580</i>	<i>8390</i>	<i>8280</i>	<i>8720</i>	<i>7090</i>
<i>Loc.-years mean</i>		<i>8980</i>	<i>9090</i>	<i>9080</i>	<i>9330</i>	<i>7730</i>
Yield % M-201		99	--	100	103	85
Number of tests		20	20	20	20	20

Table 27. Performance summary of the intermediate and late rice varieties and advanced breeding lines. Butte County, 1990.

Entry	Grain type ¹	Grain yield at 14% moisture (lbs/a)	Grain moisture at harvest (%)	Seedling vigor ² (1-5)	Days to 50% heading	Lodging ³ (1-99)	Plant height (inches)	
113	89Y485	L	11340	16.4	4.7	101	1	36.2
108	88Y211	M	11190	17.8	4.7	106	2	42.1
109	87Y488	M	10870	18.6	4.8	107	2	42.8
101	S-301	S	10840	20.0	4.8	108	3	40.5
103	88Y595	S	10700	19.0	4.8	108	11	41.0
105	89Y513	S	10580	18.8	4.7	107	8	40.2
112	A-301	L	10370	17.2	4.0	108	1	35.0
102	86Y576	S	10250	18.9	4.8	109	10	41.9
110	88Y560	M	10240	20.5	5.0	113	2	40.8
104	88Y606	S	10090	18.6	4.8	102	28	38.1
107	M-202	M	9290	17.6	4.9	96	81	30.5
106	M-401	M	7800	27.0	5.0	116	19	40.9
111	M-203	M	7370	18.4	4.9	97	99	42.5
Mean			10070	19.1	4.8	106	20	39.4
CV			5.9	7.2	1.2	0.6	64.9	12.7
LSD (.05)			850	2.0	0.1	1	19	7.2

Location: Rice Experiment Station, Biggs
 Planting date: May 4, 1990

¹S = short; M = medium; L = long; W = waxy.

²Subjective rating of 1-5 where 1 = poor and 5 = excellent seedling emergence.

³Subjective rating of 1-99 where 1 = none and 99 = 99% lodged.

Table 28. Performance summary of the intermediate and late preliminary breeding lines. Butte County, 1990.

Entry	Grain type ¹	Grain yield at 14% moisture (lbs/a)	Grain moisture at harvest (%)	Seedling vigor ² (1-5)	Days to 50% heading	Lodging ³ (1-99)	Plant height (inches)	
119	89Y296	M	11290	18.6	4.8	103	1	39.6
115	89Y506	S	11260	19.1	4.8	110	3	41.7
114	89Y510	S	11120	19.3	4.7	102	13	37.8
117	89Y515	S	10790	16.6	4.8	100	13	41.1
121	89Y537	M	10720	18.3	4.8	102	2	41.3
128	89Y557	L	10690	14.8	4.4	101	1	39.6
116	89Y516	S	10520	20.0	4.8	110	5	41.9
135	90Y135	S	10510	14.8	4.8	103	1	37.4
132	90Y132	L	10370	13.9	4.7	103	1	38.2
122	89Y543	M	10280	20.1	4.9	109	1	41.1
126	L-202	L	10280	16.6	4.7	99	1	37.2
120	89Y528	M	10210	18.5	4.8	104	2	44.5
125	89Y547	M	10110	19.1	5.0	108	1	42.5
123	89Y544	M	10040	19.2	4.9	109	4	42.7
133	90Y133	L	9710	14.2	4.7	100	3	42.9
129	89Y560	L	8900	15.7	4.6	105	15	40.5
124	89Y545	M	8900	21.1	4.9	112	5	44.9
130	89Y561	L	8500	16.4	4.5	103	50	43.1
127	89Y562	L	7070	16.5	4.3	106	55	43.1
134	90Y134	L	6740	15.0	4.2	99	5	37.2
131	89Y563	L	6600	17.0	4.7	102	80	45.9
118	90Y118	S	5740	19.8	4.8	108	98	46.1
Mean			9560	17.5	4.7	104	16	41.4
CV			5.2	5.3	1.8	0.9	29.9	3.6
LSD (.05)			1030	1.9	0.2	2	10	3.1

Location: Rice Experiment Station, Biggs
Planting date: May 4, 1990

¹S = short; M = medium; L = long; W = waxy.

²Subjective rating of 1-5 where 1 = poor and 5 = excellent seedling emergence.

³Subjective rating of 1-99 where 1 = none and 99 = 99% lodged.

Table 29. Performance summary of the intermediate and late rice varieties and advanced breeding lines. Glenn County, 1990.

Entry	Grain type ¹	Grain yield at 14% moisture (lbs/a)	Grain moisture at harvest (%)	Seedling vigor ² (1-5)	Days to 50% heading	Lodging ³ (1-99)	Plant height (inches)
112 A-301	L	10700	16.3	3.5	110	13	38.3
104 88Y606	S	10280	18.6	4.0	110	35	41.0
109 87Y488	M	10200	17.3	3.8	110	29	44.4
103 88Y595	S	10190	20.3	4.0	111	61	44.0
101 S-301	S	9990	20.5	4.1	111	55	43.4
113 89Y485	L	9760	16.1	3.7	109	1	35.4
102 86Y576	S	9710	19.5	4.0	112	45	42.7
108 88Y211	M	9490	17.9	4.0	111	46	45.2
105 89Y513	S	9450	19.6	4.0	110	53	39.8
107 M-202	M	9100	16.4	4.1	101	79	42.9
106 M-401	M	8600	17.7	4.2	116	84	42.5
110 88Y560	M	8080	16.3	4.2	116	61	42.5
111 M-203	M	7760	16.4	3.9	101	85	40.7
Mean		9490	17.9	3.9	110	50	41.8
CV		7.2	6.1	2.6	1.5	26.0	5.1
LSD (.05)		980	1.6	0.1	2	19	3.1

Location: Norman Road

Planting date: April 20, 1990

¹S = short; M = medium; L = long; W = waxy.

²Subjective rating of 1-5 where 1 = poor and 5 = excellent seedling emergence.

³Subjective rating of 1-99 where 1 = none and 99 = 99% lodged.

Table 30. Performance summary of the intermediate and late preliminary breeding lines. Glenn County, 1990.

Entry	Grain type ¹	Grain yield at 14% moisture (lbs/a)	Grain moisture at harvest (%)	Seedling vigor ² (1-5)	Days to 50% heading	Lodging ³ (1-99)	Plant height (inches)	
119	89Y296	M	10980	17.1	3.7	110	13	40.3
122	89Y543	M	10810	17.6	3.9	111	45	45.7
121	89Y537	M	10090	17.5	4.0	109	25	45.9
123	89Y544	M	10020	16.8	3.9	111	43	44.1
114	89Y510	S	9880	19.4	4.0	110	30	40.2
115	89Y506	S	9640	21.4	4.0	113	55	41.9
135	90Y135	L	9380	16.0	3.9	110	50	42.3
125	89Y547	M	9350	18.0	3.8	110	58	43.3
116	89Y516	S	9200	20.2	4.0	112	30	40.9
117	89Y515	S	9160	18.5	3.9	109	45	43.9
132	90Y132	L	9120	15.8	3.8	109	1	41.3
126	L-202	L	9100	16.0	3.7	108	1	34.5
133	90Y133	L	9010	14.5	3.5	106	1	40.5
128	89Y557	L	8910	15.5	3.5	110	1	40.9
120	89Y528	M	8810	17.6	3.8	110	78	41.7
124	89Y545	M	8770	17.6	4.0	110	73	42.5
130	89Y561	L	7750	18.5	3.1	109	65	39.4
129	89Y560	L	7710	16.1	3.1	110	50	45.3
127	89Y562	L	6720	17.6	3.7	111	83	46.1
134	90Y134	L	6620	16.6	3.2	110	45	41.9
118	90Y118	S	6090	18.4	3.7	111	95	46.1
131	89Y563	L	5870	20.6	2.9	110	88	47.8
Mean		8770	17.6	3.7	110	44	42.6	
CV		7.9	5.0	4.2	0.7	38.2	6.2	
LSD (.05)		1440	1.8	0.3	2	35	5.5	

Location: Norman Road

Planting date: April 20, 1990

¹S = short; M = medium; L = long; W = waxy.

²Subjective rating of 1-5 where 1 = poor and 5 = excellent seedling emergence.

³Subjective rating of 1-99 where 1 = none and 99 = 99% lodged.

Table 31. Performance summary of the intermediate and late rice varieties and advanced breeding lines. Sutter County, 1990.

Entry	Grain type ¹	Grain yield	Grain	Seedling	Lodging ³	Plant
		at 14% moisture (lbs/a)	moisture at harvest (%)	vigor ² (1-5)	(1-99)	height (inches)
101 S-301	S	9350	14.1	3.6	71	38.9
102 86Y576	S	9130	14.6	3.9	17	39.5
105 89Y513	S	8830	15.7	3.6	31	37.5
103 88Y595	S	8750	15.4	4.0	53	40.3
112 A-301	L	8520	13.6	3.3	3	32.6
108 88Y211	M	8520	13.8	4.1	53	39.8
109 87Y488	M	8100	14.4	3.9	56	41.0
106 M-401	M	7990	11.1	4.1	94	42.0
107 M-202	M	7990	13.7	4.1	65	39.1
104 88Y606	S	7950	15.1	3.8	30	36.8
110 88Y560	M	7950	13.7	4.6	50	39.1
113 89Y485	L	7880	13.6	4.1	13	34.3
111 M-203	M	6220	13.2	4.1	76	39.6
Mean		8240	14.0	3.9	47	38.5
CV		11.4	6.8	14.9	33.9	4.0
LSD (.05)		1350	1.4	NS	23	2.2

Location: Shannon Ranch
Planting date: April 27, 1990

¹S = short; M = medium; L = long; W = waxy.

²Subjective rating of 1-5 where 1 = poor and 5 = excellent seedling emergence.

³Subjective rating of 1-99 where 1 = none and 99 = 99% lodged.

Table 32. Performance summary of the intermediate and preliminary breeding lines. Sutter County, 1990.

Entry	Grain type ¹	Grain yield	Grain	Seedling	Lodging ³	Plant
		at 14% moisture (lbs/a)	moisture at harvest (%)	vigor ² (1-5)	(1-99)	height (inches)
121 89Y537	M	9710	13.6	4.3	28	38.4
122 89Y543	M	9240	13.4	4.0	53	38.6
115 89Y506	S	9210	15.6	4.0	40	39.6
133 90Y133	L	8950	12.1	4.3	8	39.4
116 89Y516	S	8740	15.9	4.0	5	38.6
126 L-202	L	8710	14.1	3.3	1	33.7
114 89Y510	S	8640	15.0	3.3	30	36.2
125 89Y547	M	8540	14.9	3.8	23	40.0
123 89Y544	M	8490	15.1	3.5	75	41.5
132 90Y132	L	8490	13.6	3.3	3	32.9
119 89Y296	M	8300	14.7	3.3	55	36.2
120 89Y528	M	8020	14.3	3.5	55	40.8
135 90Y135	L	7930	13.8	3.8	8	34.7
117 89Y515	S	7820	16.3	3.5	53	37.0
124 89Y545	M	7820	14.4	3.0	60	41.7
128 89Y557	L	7800	13.9	2.5	3	36.2
129 89Y560	L	7200	14.7	3.3	13	35.4
127 89Y562	L	6920	13.4	3.3	50	39.2
134 90Y134	L	6560	13.5	2.3	3	36.2
118 90Y118	S	5930	13.3	3.8	99	41.2
130 89Y561	L	5730	14.3	3.0	63	41.3
131 89Y563	L	5530	15.6	3.0	92	43.9
Mean		7920	14.3	3.4	37	38.3
CV		9.7	5.0	7.9	58.7	5.2
LSD (.05)		1590	1.5	0.6	45	4.1

Location: Shannon Ranch

Planting date: April 27, 1990

¹S = short; M = medium; L = long; W = waxy.

²Subjective rating of 1-5 where 1 = poor and 5 = excellent seedling emergence.

³Subjective rating of 1-99 where 1 = none and 99 = 99% lodged.

Table 34. Performance of the intermediate and late preliminary breeding lines, three-location summary (Butte, Glenn and Sutter counties).

Entry	Grain type ¹	Grain yield at 14% moisture (lbs/a)	Grain moisture at harvest (%)	Seedling vigor ² (1-5)	Days to 50% heading ³	Lodging ⁴ (1-99)	Plant height (inches)	
119	89Y296	M	10190	16.8	3.9	106	23	38.7
121	89Y537	M	10180	16.5	4.4	105	18	41.9
122	89Y543	M	10110	17.0	4.3	110	33	41.8
115	89Y506	S	10040	18.7	4.3	111	33	41.1
114	89Y510	S	9880	17.9	4.0	106	24	38.1
123	89Y544	M	9520	17.0	4.1	110	40	42.8
116	89Y516	S	9480	18.7	4.3	111	13	40.5
126	L-202	L	9360	15.6	3.9	104	1	35.1
125	89Y547	M	9330	17.4	4.2	109	27	41.9
132	90Y132	L	9330	14.4	3.9	106	2	37.5
135	90Y135	L	9270	14.9	4.2	106	20	38.1
117	89Y515	S	9250	17.1	4.1	104	37	40.7
133	90Y133	L	9220	13.6	4.1	103	4	40.9
128	89Y557	L	9140	14.7	3.5	105	2	38.9
120	89Y528	M	9010	16.8	4.1	107	45	42.3
124	89Y545	M	8490	17.7	4.0	111	46	43.0
129	89Y560	L	7930	15.5	3.7	108	26	40.4
130	89Y561	L	7330	16.4	3.5	106	59	41.3
127	89Y562	L	6900	15.9	3.7	108	63	42.8
134	90Y134	L	6640	15.0	3.2	104	18	38.5
131	89Y563	L	6000	17.8	3.5	106	87	45.9
118	90Y118	S	5920	17.1	4.1	110	97	44.4
Mean			8750	16.5	3.9	107	33	40.7
CV			7.5	5.1	4.7	0.8	49.7	5.1
LSD (.05)			760	1.0	0.2	1	19	2.4

¹S = short; M = medium; L = long; W = waxy.

²Subjective rating of 1-5 where 1 = poor and 5 = excellent seedling emergence.

³Days to 50% heading is at two locations only--does not include Sutter County.

⁴Subjective rating of 1-99 where 1 = none and 99 = completely lodged.

Table 35. Grain yield summary of the intermediate and late advanced lines and varieties by location and year.

Location	Year	M-401	A-301	S-301 (85-Y-502)
Butte	1986	10040	9520	9880
	1987	9890	3410	9370
	1988	9330	9520	9920
	1989	9070	10040	10890
	1990	7800	10370	10840
<i>Loc. mean</i>		9230	8570	10180
Glenn/Colusa	1987	8690	6390	7140
	1988	6270	5890	6740
	1989	8780	8660	9310
	1990	8600	10700	9990
<i>Loc. mean</i>		8080	7910	8300
Sutter	1986	8340	5110	7830
	1987	8070	7640	8600
	1988	7560	6050	7420
	1989	8340	7730	7380
	1990	7990	8520	9350
<i>Loc. mean</i>		8060	7010	8120
<i>Loc.-years mean</i>		8480	7820	8900
Yield % M-401		--	92	105
Number of tests		14	14	14