

2023 Missouri Rice Seeding Rate Trials

Flood-Irrigated and Furrow-Irrigated Production Systems

Conducted by the
University of Missouri Rice Agronomy Program

Funding and support provided by the
Missouri Rice Research and Merchandising Council

By J.L. Chlapecka, M. Johnson, L. Rhodes, C. Hunt



University of Missouri

Rice Agronomy

Table of Contents

Agronomic Information	3
Trial Averages	4
Flood-Irrigated Rice Grain Yield.....	4
Furrow-Irrigated Rice Grain Yield	6
Site-Specific Trial Data	8
Rice Farm Flood-Irrigated Seeding Rate x Planting Date.....	8
Portageville Flood-Irrigated Seeding Rate x Planting Date	10
Rice Farm Furrow-Irrigated	12
Portageville Furrow-Irrigated	14
Rives Furrow-Irrigated.....	16
Summary	18

2023 Missouri Rice Seeding Rate Trials

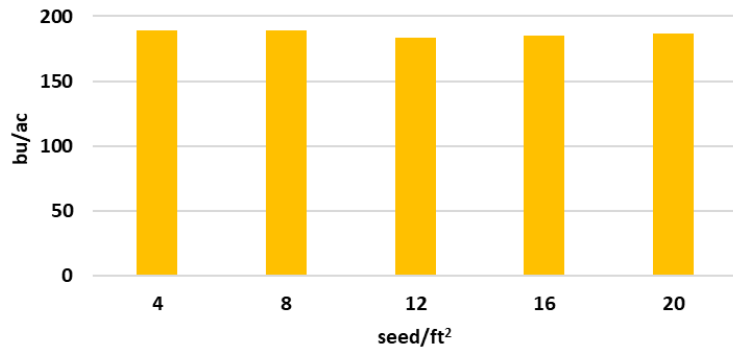
Site	Nearest Town	Planting Date	Emergence Date	Flood Date	Harvest Date	Soil Type	Location Info	Water Management	N Management	N Rate (lbs N/ac)
MRRMC Early	Glennonville, Dunklin County	March 15	April 13	May 26	September 13	Silt Loam	Research Station	Flood	Single Pre-flood	130
MRRMC Normal	Glennonville, Dunklin County	April 20	May 3	May 26	September 13	Silt Loam	Research Station	Flood	Single Pre-flood	130
MRRMC Late	Glennonville, Dunklin County	June 6	June 12	July 8	October 24	Silt Loam	Research Station	Flood	Single Pre-flood	130
FDRC Early	Portageville, Pemiscot County	March 16	April 10	May 23	September 7	Clay	Research Station	Flood	Single Pre-flood	150
FDRC Normal	Portageville, Pemiscot County	April 19	May 1	May 30	September 15	Clay	Research Station	Flood	Single Pre-flood	150
FDRC Late	Portageville, Pemiscot County	June 13	June 21	July 10	October 23	Clay	Research Station	Flood	Single Pre-flood	150
FDRC Clay	Portageville, Pemiscot County	May 1	May 20	June 15	October 4	Clay	Research Station	Flood	Single Pre-flood	150
MRRMC FIR Top	Glennonville, Dunklin County	April 11	May 1	May 31	September 19	Silt Loam	Research Station	Non-Flood	3-way split	138
MRRMC FIR Middle	Glennonville, Dunklin County	April 11	May 1	May 31	September 19	Silt Loam	Research Station	Muddy	3-way split	138
MRRMC FIR Bottom	Glennonville, Dunklin County	April 11	May 1	May 31	September 19	Silt Loam	Research Station	Flood	3-way split	138
FDRC FIR Top	Portageville, Pemiscot County	April 13	May 3	May 31	September 20	Clay	Research Station	Non-Flood	3-way split	196
FDRC FIR Middle	Portageville, Pemiscot County	April 13	May 3	May 31	September 20	Clay	Research Station	Muddy	3-way split	196
FDRC FIR Bottom	Portageville, Pemiscot County	April 13	May 3	May 31	September 20	Clay	Research Station	Flood	3-way split	196
Rives FIR Top	Portageville, Pemiscot County	April 12	N/A	N/A	September 26	Clay	On-Farm	Non-Flood	3-way split	196
Rives FIR Middle	Portageville, Pemiscot County	April 12	N/A	N/A	September 26	Clay	On-Farm	Muddy	3-way split	196
Rives FIR Bottom	Portageville, Pemiscot County	April 12	N/A	N/A	September 26	Clay	On-Farm	Flood	3-way split	196

Materials & Methods: Seeding rate trials were planted in flood-irrigated rice on two sites, Portageville (FDRC) and the Rice Farm (MRRMC) and at three planting dates, early, normal and late planted. Furrow-irrigated trials were planted within the “normal” planting window at three sites, FDRC, MRRMC, and Rives (on-farm) and within three areas of the field, top, middle, and bottom. One hybrid cultivar was utilized, RT7421 FP, and was planted at 4, 8, 12, 16, and 20 seed/ft². Three inbred varieties were also planted, CLL18, Ozark, and DG263L at 10, 20, 30, 40, and 50 seed/ft². Due to seed size differences, the equivalent seeding rate in pounds per acre is included for each treatment in the data tables on the following pages.

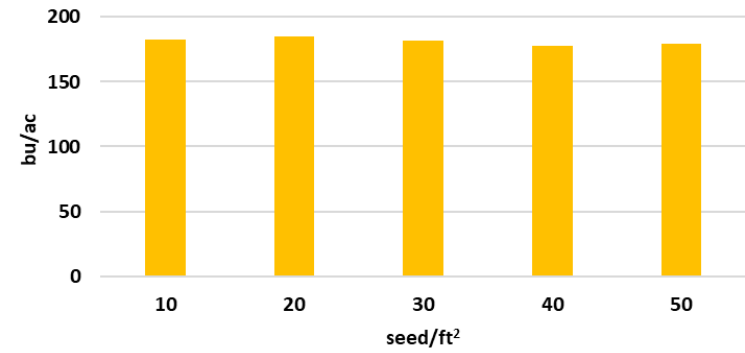
2023 Missouri Flood Rice Seeding Rate Studies

Cultivar	Seeding Rate		mid-March		mid-April		early June		AVERAGE	
	seed/ft ²	lb/ac	Stand	Yield	Stand	Yield	Stand	Yield	Stand	Yield
RT7421 FP	4	9	3	214	3	214	3	139	3	189
RT7421 FP	8	19	5	200	6	210	5	158	6	189
RT7421 FP	12	28	5	187	8	198	7	166	6	184
RT7421 FP	16	37	6	178	10	209	9	167	8	185
RT7421 FP	20	46	7	193	9	202	11	165	9	187
Ozark	10	24	6	194	8	206	7	163	7	187
Ozark	20	48	6	194	9	201	11	174	9	189
Ozark	30	71	9	185	16	188	15	171	14	181
Ozark	40	95	10	185	19	182	15	171	15	179
Ozark	50	119	12	175	23	167	18	170	18	171
DG263L	10	24	9	195	8	205	8	147	9	182
DG263L	20	49	10	189	11	208	11	157	11	185
DG263L	30	73	14	177	13	211	15	157	14	182
DG263L	40	98	15	173	18	205	17	155	16	178
DG263L	50	122	17	184	21	201	16	153	18	179
CLL18	10	23	8	204	8	199	7	143	8	182
CLL18	20	45	9	182	13	211	9	153	10	182
CLL18	30	68	14	183	16	191	15	150	15	175
CLL18	40	91	17	186	17	190	18	156	18	177
CLL18	50	114	17	169	18	182	21	152	19	168
AVERAGE			10	187	13	199	12	158	12	182

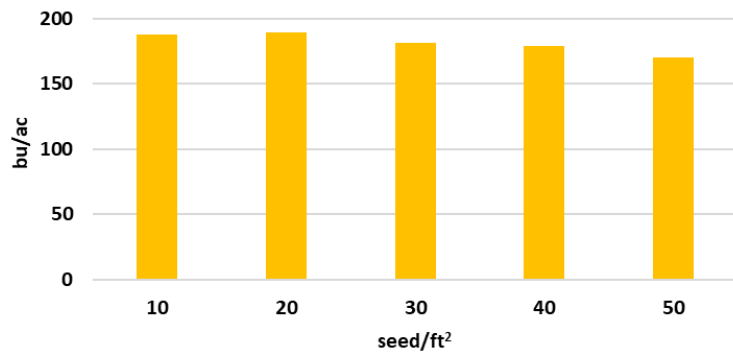
RT7421 FP



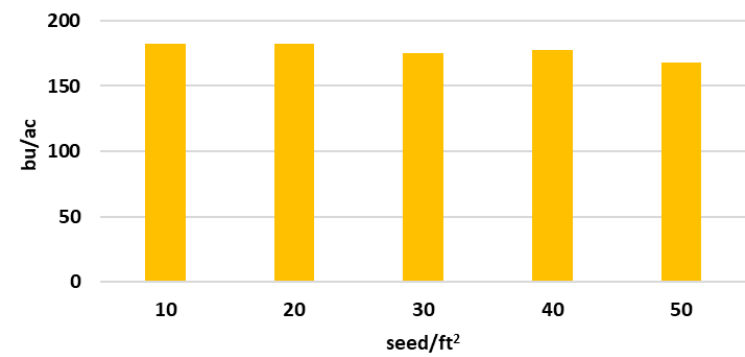
DG263L



Ozark



CLL18

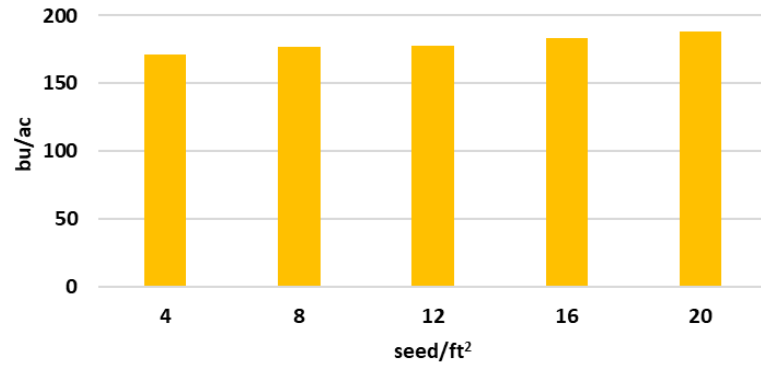


2023 Missouri Furrow-Irrigated Rice Seeding Rate Studies

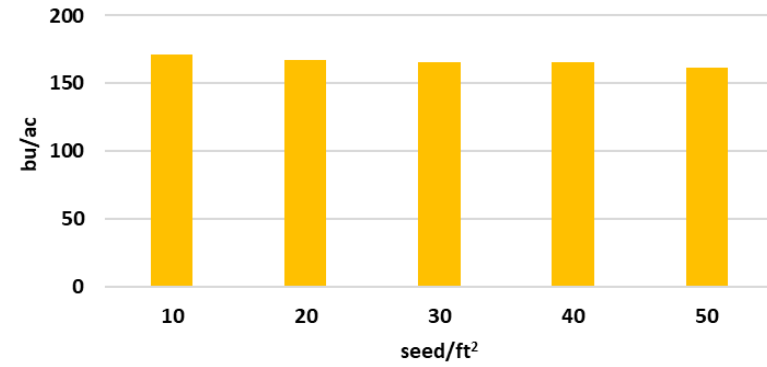
Cultivar	Seeding Rate		Top		Middle		Bottom		AVERAGE	
	seed/ft ²	lb/ac	Stand	Yield	Stand	Yield	Stand	Yield	Stand	Yield
	seed/ft ²	lb/ac	seed/ft ²	bu/ac	seed/ft ²	bu/ac	seed/ft ²	bu/ac	seed/ft ²	bu/ac
RT7421 FP	4	9	2	147	3	170	4	196	3	171
RT7421 FP	8	19	4	157	5	176	11	197	7	177
RT7421 FP	12	28	7	160	8	181	11	193	9	178
RT7421 FP	16	37	8	164	10	183	10	203	9	183
RT7421 FP	20	46	7	176	11	198	11	191	10	188
Ozark	10	24	5	136	7	162	7	181	6	159
Ozark	20	48	9	143	11	166	9	182	10	163
Ozark	30	71	12	133	18	172	12	177	14	160
Ozark	40	95	16	139	19	169	16	184	17	164
Ozark	50	119	17	132	20	173	17	170	18	158
DG263L	10	24	6	152	7	178	9	183	7	171
DG263L	20	49	9	147	11	173	11	181	11	167
DG263L	30	73	13	149	15	167	13	179	14	165
DG263L	40	98	17	146	20	173	17	177	18	165
DG263L	50	122	19	149	22	169	16	167	19	162
CLL18	10	23	6	123	8	171	6	178	7	157
CLL18	20	45	9	130	11	174	13	180	11	161
CLL18	30	68	14	138	15	181	12	185	14	168
CLL18	40	91	15	134	17	169	17	175	16	159
CLL18	50	114	17	147	21	175	16	178	18	167
AVERAGE			11	145	13	174	12	183	12	167

* Furrow-irrigated rice trials were planted at Glennonville on April 11, Rives on April 12, and Portageville on April 13.

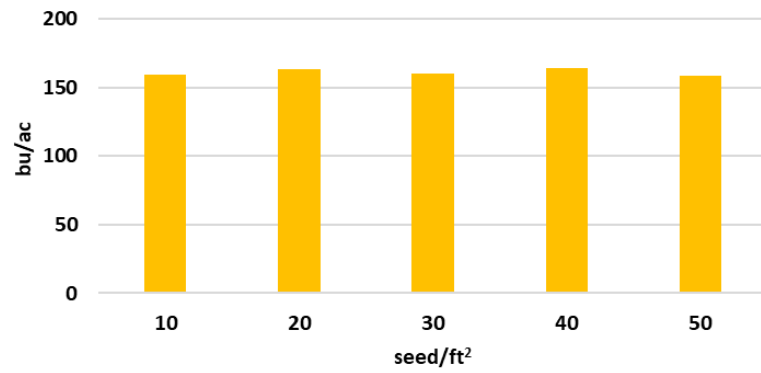
RT7421 FP



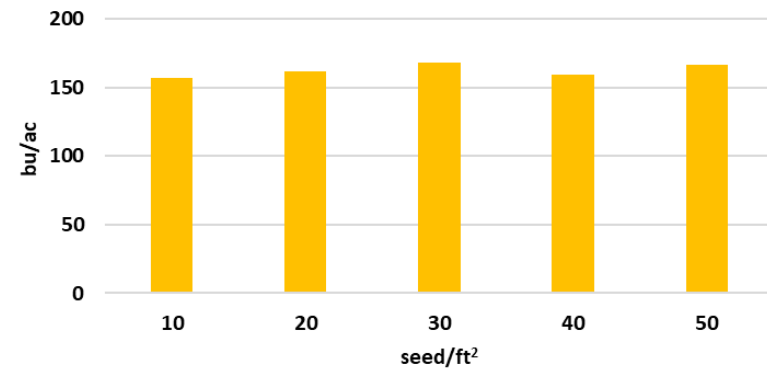
DG263L



Ozark



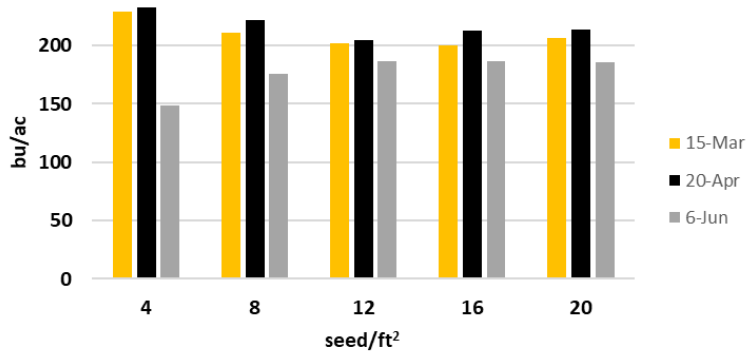
CLL18



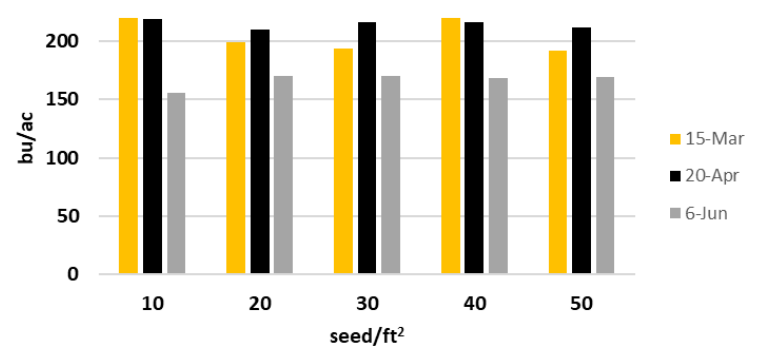
2023 Rice Farm Flood Rice Seed Rate x Plant Date Study

Cultivar	Seeding Rate		15-Mar			20-Apr			6-Jun		
	seed/ft ²	lb/ac	Stand	Lodging	Yield	Stand	Lodging	Yield	Stand	Lodging	Yield
	seed/ft ²	lb/ac	seed/ft ²	1-9	bu/ac	seed/ft ²	1-9	bu/ac	seed/ft ²	1-9	bu/ac
RT7421 FP	4	9	5	1	229	3	1	233	-	1	149
RT7421 FP	8	19	9	1	211	7	1	222	-	1	175
RT7421 FP	12	28	6	1	202	10	1	205	-	1	186
RT7421 FP	16	37	8	1	200	11	1	213	-	1	186
RT7421 FP	20	46	10	1	207	8	1	214	-	1	185
Ozark	10	24	8	1	218	8	1	219	-	1	176
Ozark	20	48	6	1	196	12	1	224	-	1	189
Ozark	30	71	8	1	205	17	1	202	-	1	184
Ozark	40	95	6	1	199	20	1	196	-	1	182
Ozark	50	119	11	1	161	26	1	188	-	1	181
DG263L	10	24	14	1	220	9	1	219	-	1	156
DG263L	20	49	11	1	199	11	1	210	-	1	170
DG263L	30	73	15	1	194	14	1	216	-	1	170
DG263L	40	98	12	1	220	20	1	216	-	1	169
DG263L	50	122	11	1	192	21	1	212	-	1	170
CLL18	10	23	12	1	226	7	1	217	-	1	158
CLL18	20	45	8	1	180	11	1	223	-	1	173
CLL18	30	68	12	1	203	14	1	212	-	1	168
CLL18	40	91	15	1	195	14	1	206	-	1	177
CLL18	50	114	13	1	175	15	1	201	-	1	172
AVERAGE			10	1	202	13	1	212	-	1	174

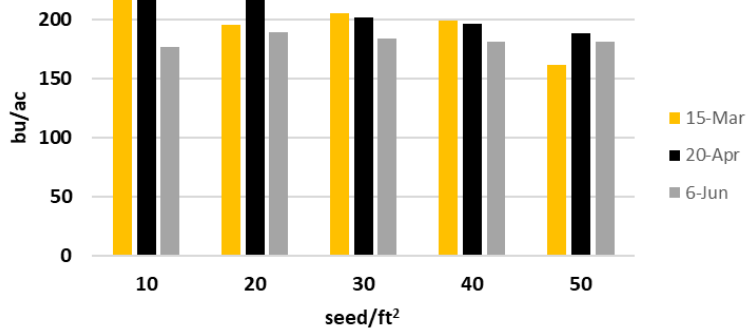
RT7421 FP



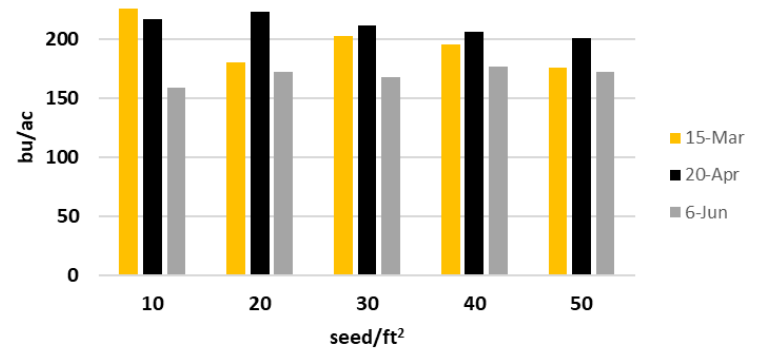
DG263L



Ozark



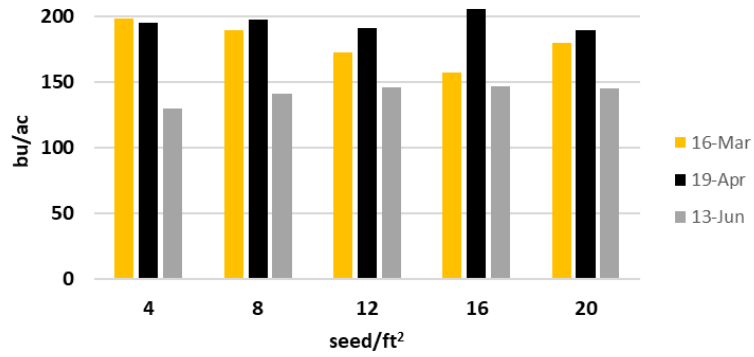
CLL18



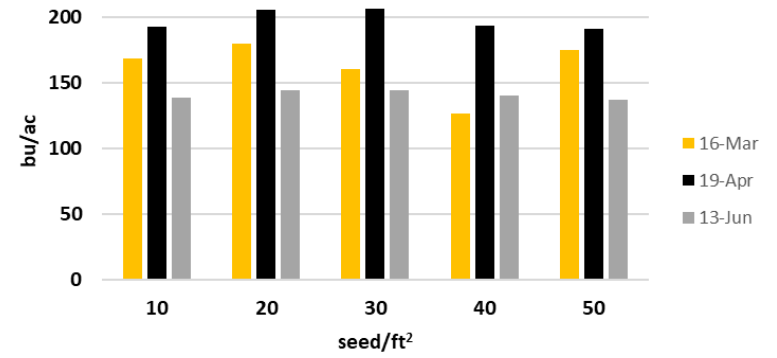
2023 Portageville Flood Rice Seed Rate x Plant Date Study

Cultivar	Seeding Rate		16-Mar			19-Apr			13-Jun		
			Stand	Lodging	Yield	Stand	Lodging	Yield	Stand	Lodging	Yield
	seed/ft ²	lb/ac	seed/ft ²	1-9	bu/ac	seed/ft ²	1-9	bu/ac	seed/ft ²	1-9	bu/ac
RT7421 FP	4	9	1	1	198	3	1	195	3	1	130
RT7421 FP	8	19	2	3	190	6	2	197	5	1	141
RT7421 FP	12	28	3	1	173	5	2	191	7	1	146
RT7421 FP	16	37	4	6	157	9	2	206	9	1	147
RT7421 FP	20	46	5	4	179	11	3	189	11	1	145
Ozark	10	24	3	3	170	7	2	193	7	1	149
Ozark	20	48	7	1	192	7	3	177	11	1	160
Ozark	30	71	10	4	166	16	1	174	15	1	158
Ozark	40	95	13	4	172	19	3	168	15	1	160
Ozark	50	119	12	1	189	20	4	145	18	1	159
DG263L	10	24	5	3	169	8	1	192	8	1	139
DG263L	20	49	10	3	179	11	1	206	11	1	144
DG263L	30	73	13	2	161	12	1	206	15	1	144
DG263L	40	98	18	6	127	15	1	194	17	1	141
DG263L	50	122	23	1	175	22	2	191	16	1	137
CLL18	10	23	5	2	183	8	3	182	7	1	127
CLL18	20	45	9	1	183	15	1	199	9	1	134
CLL18	30	68	16	5	164	18	5	170	15	1	133
CLL18	40	91	19	2	177	20	3	174	18	1	134
CLL18	50	114	21	5	162	21	4	163	21	1	132
AVERAGE			10	3	173	13	2	186	12	1	143

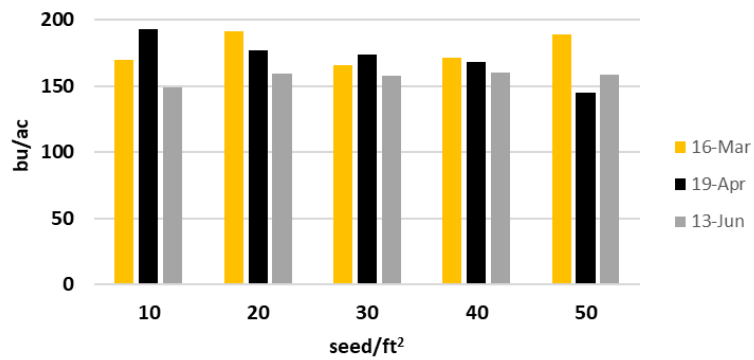
RT7421 FP



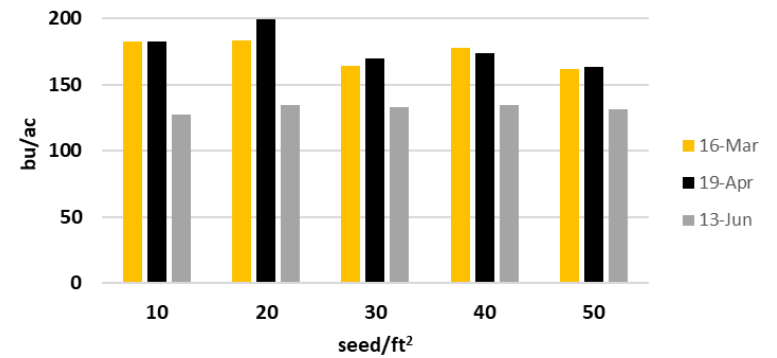
DG263L



Ozark



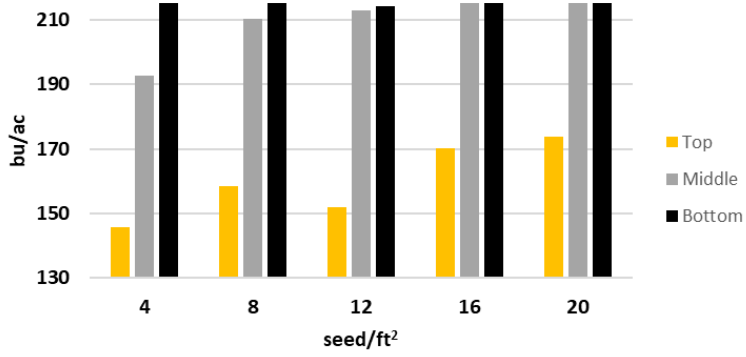
CLL18



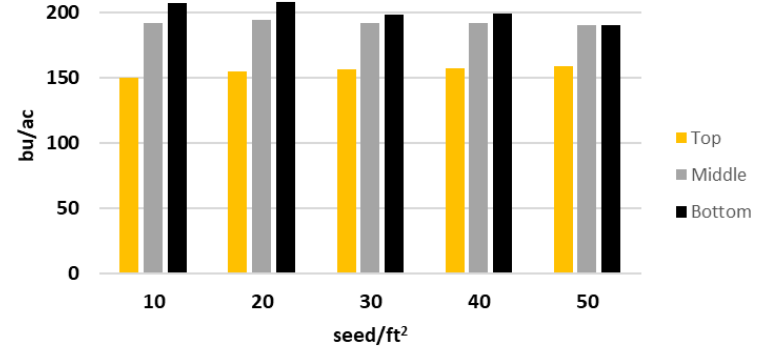
2023 Rice Farm Furrow-Irrigated Rice Seed Rate Study

Cultivar	Seeding Rate		Top			Middle			Bottom		
	seed/ft ²	lb/ac	Stand seed/ft ²	Yield bu/ac	Milling HR-TR	Stand seed/ft ²	Yield bu/ac	Milling HR-TR	Stand seed/ft ²	Yield bu/ac	Milling HR-TR
RT7421 FP	4	9	2	146	60-74	3	193	61-74	3	229	63-74
RT7421 FP	8	19	4	159	56-74	7	210	59-74	12	217	63-73
RT7421 FP	12	28	9	152	54-73	11	213	61-74	13	214	64-75
RT7421 FP	16	37	9	170	58-74	9	216	63-74	10	225	66-74
RT7421 FP	20	46	8	174	55-72	11	223	62-73	12	216	64-74
Ozark	10	24	5	139	64-74	9	183	68-75	7	193	69-75
Ozark	20	48	9	135	63-73	13	191	71-77	12	202	67-74
Ozark	30	71	10	145	62-72	21	198	70-77	14	203	68-75
Ozark	40	95	16	142	61-72	23	196	69-75	21	205	68-75
Ozark	50	119	18	141	66-76	27	199	71-77	24	201	66-74
DG263L	10	24	7	149	60-72	7	192	61-70	8	207	64-71
DG263L	20	49	11	155	58-71	16	194	64-73	12	208	64-72
DG263L	30	73	13	156	58-72	16	192	59-72	19	198	65-72
DG263L	40	98	20	157	56-71	23	192	59-72	20	199	64-73
DG263L	50	122	19	159	58-73	24	190	59-70	25	190	63-72
CLL18	10	23	6	133	64-74	8	204	63-71	8	214	64-73
CLL18	20	45	12	144	61-73	13	206	61-72	12	225	62-72
CLL18	30	68	15	148	60-72	20	211	61-73	15	220	65-72
CLL18	40	91	17	150	59-72	23	213	61-71	25	224	64-72
CLL18	50	114	17	156	59-72	29	214	61-73	27	221	63-72
AVERAGE			11	150	60-73	16	201	63-73	15	210	65-73

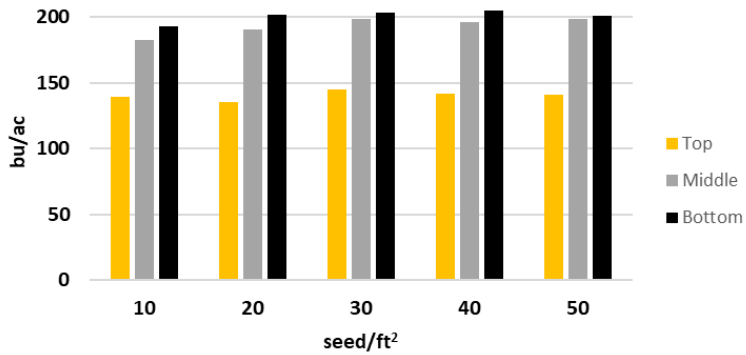
RT7421 FP



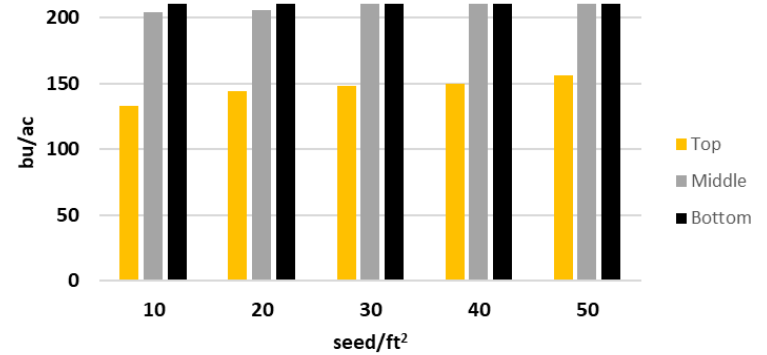
DG263L



Ozark



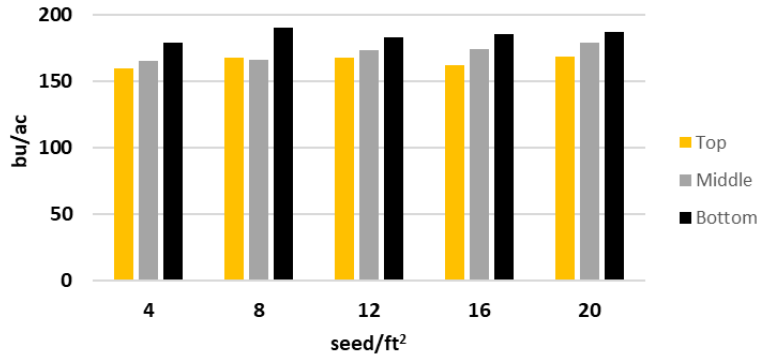
CLL18



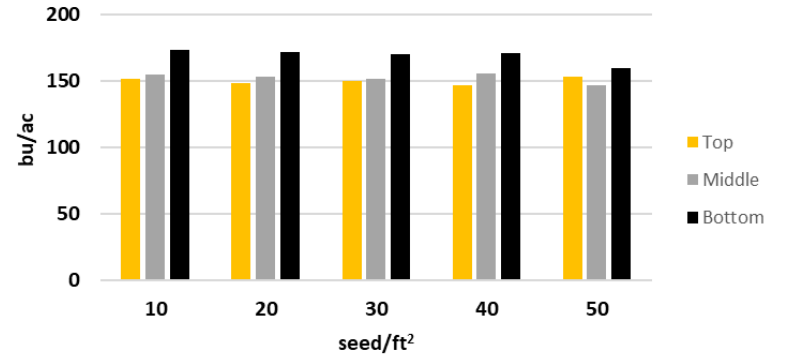
2023 Portageville Furrow-Irrigated Rice Seed Rate Study

Cultivar	Seeding Rate		Top			Middle			Bottom		
	seed/ft ²	lb/ac	Stand seed/ft ²	Yield bu/ac	Milling HR-TR	Stand seed/ft ²	Yield bu/ac	Milling HR-TR	Stand seed/ft ²	Yield bu/ac	Milling HR-TR
RT7421 FP	4	9	2	159	64-73	2	166	64-74	2	179	64-74
RT7421 FP	8	19	4	168	65-73	4	166	65-74	4	190	64-75
RT7421 FP	12	28	5	168	64-73	7	173	66-74	5	183	63-74
RT7421 FP	16	37	8	162	64-72	12	174	65-74	7	186	61-74
RT7421 FP	20	46	6	168	62-72	13	179	63-73	9	187	62-74
Ozark	10	24	5	130	65-73	7	134	68-75	5	161	66-74
Ozark	20	48	7	138	66-73	8	137	68-74	6	157	68-76
Ozark	30	71	10	132	66-74	13	145	67-74	9	157	63-73
Ozark	40	95	14	132	65-72	16	145	68-74	13	168	67-75
Ozark	50	119	13	136	67-74	16	142	67-74	11	160	68-76
DG263L	10	24	5	151	61-71	6	154	58-71	7	173	63-74
DG263L	20	49	8	149	59-70	11	153	58-71	11	171	61-73
DG263L	30	73	11	150	58-71	14	152	59-71	11	170	61-72
DG263L	40	98	13	147	57-70	17	156	58-71	16	170	58-73
DG263L	50	122	14	153	58-71	18	146	58-71	12	159	61-72
CLL18	10	23	7	128	65-73	6	141	66-73	5	163	64-74
CLL18	20	45	7	138	65-72	10	140	67-74	10	164	67-74
CLL18	30	68	13	144	66-73	13	144	67-74	10	164	68-75
CLL18	40	91	11	128	64-72	13	145	67-74	11	167	66-74
CLL18	50	114	14	142	65-73	19	143	68-74	15	165	67-75
AVERAGE			9	146	63-72	11	152	64-73	9	170	64-74

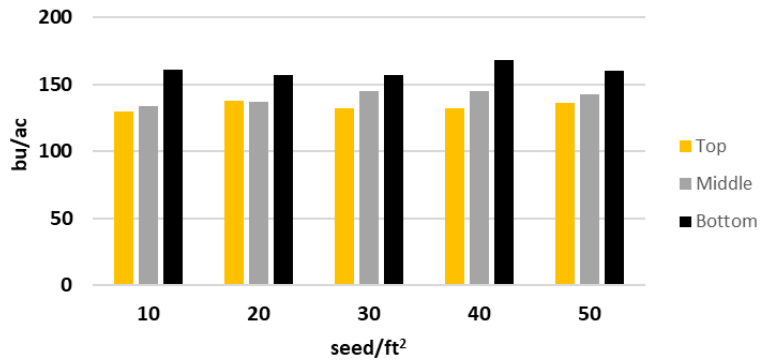
RT7421 FP



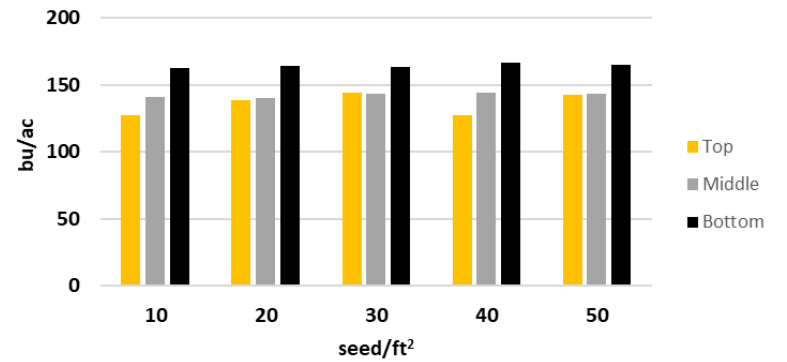
DG263L



Ozark



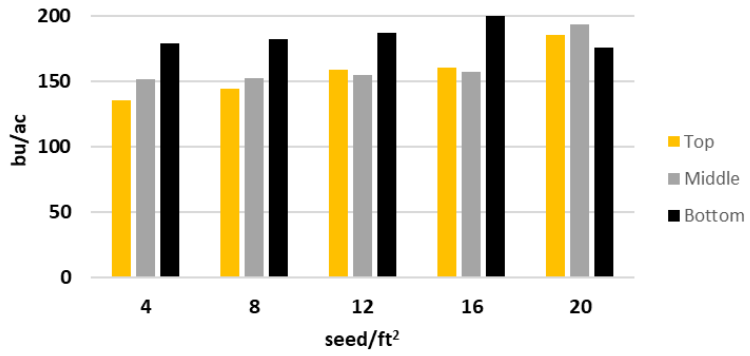
CLL18



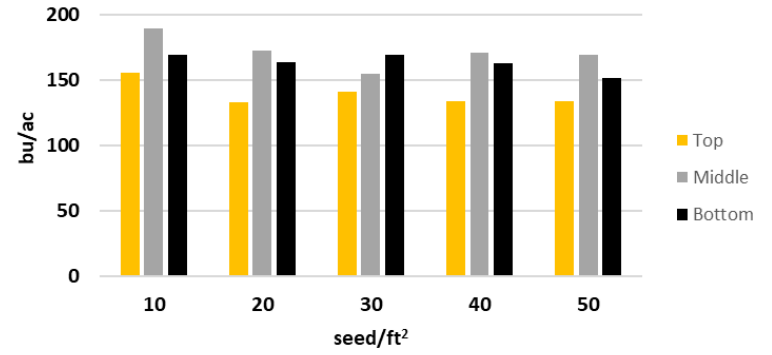
2023 Rives Furrow-Irrigated Rice Seed Rate Study

Cultivar	Seeding Rate		Top				Middle				Bottom			
	seed/ft ²	lb/ac	Stand	Yield	Lodging	Milling	Stand	Yield	Lodging	Milling	Stand	Yield	Lodging	Milling
RT7421 FP	4	9	2	136	7	36-69	4	152	6	43-70	9	179	3	51-71
RT7421 FP	8	19	5	144	7	30-67	6	153	6	53-71	17	182	4	50-71
RT7421 FP	12	28	8	159	7	42-70	6	155	8	45-70	16	187	4	49-71
RT7421 FP	16	37	8	161	7	42-70	9	157	6	48-71	12	200	6	50-72
RT7421 FP	20	46	9	185	8	39-70	10	193	6	41-71	14	176	6	50-71
Ozark	10	24	5	136	2	59-72	4	169	7	62-73	10	187	1	61-70
Ozark	20	48	11	154	3	36-70	13	170	6	51-71	10	186	1	63-73
Ozark	30	71	16	121	5	55-72	20	172	7	61-73	12	178	2	62-73
Ozark	40	95	19	142	4	39-69	18	165	7	60-72	12	179	3	62-73
Ozark	50	119	20	118	5	56-71	20	177	6	60-73	17	149	6	60-72
DG263L	10	24	7	155	4	40-69	9	189	8	47-69	12	169	3	54-71
DG263L	20	49	9	133	7	23-65	5	173	7	43-68	11	163	2	48-69
DG263L	30	73	15	141	6	36-67	14	155	6	40-67	10	169	3	53-70
DG263L	40	98	19	134	6	37-68	20	171	8	42-68	15	163	5	51-69
DG263L	50	122	23	134	6	30-66	23	169	5	41-68	12	151	4	49-68
CLL18	10	23	5	104	7	51-69	11	165	7	58-73	6	156	3	56-70
CLL18	20	45	9	109	7	42-69	8	175	5	55-71	19	151	7	58-71
CLL18	30	68	14	122	8	42-70	13	188	7	51-71	12	166	7	56-70
CLL18	40	91	18	124	7	45-68	15	148	7	54-71	14	135	7	55-70
CLL18	50	114	21	141	7	52-70	16	169	7	51-69	6	148	6	54-69
AVERAGE			12	138	6	42-69	12	168	7	50-71	12	169	4	55-71

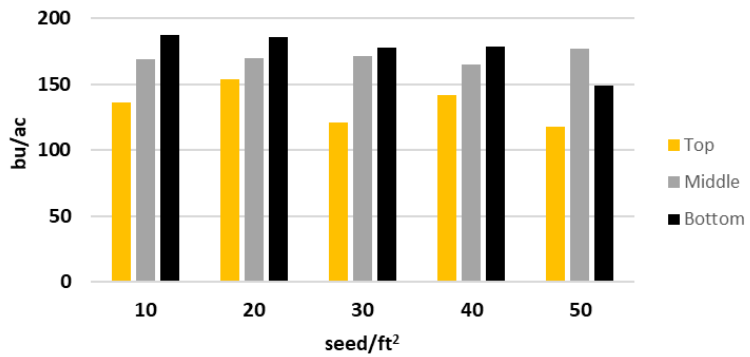
RT7421 FP



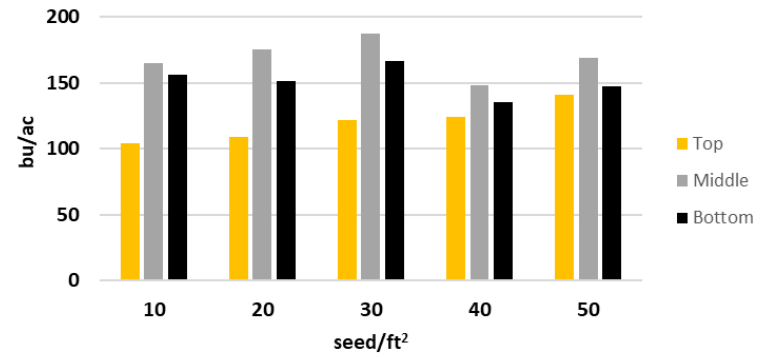
DG263L



Ozark



CLL18



Results:

Flood-Irrigated Rice: Results from the seeding rate studies suggest that seeding rate could potentially be lowered while maintaining yield potential. We've known all along that with modern-day cultivars and seeding equipment, seeding rate can likely be lowered. The reason seeding rate recommendations remain where they are (around 60 lbs/acre for most varieties and 23 lbs/acre for hybrids) is due to variability across a field as well as among rice drills, whereas an optimal stand will not always be achieved. Keep in mind that these studies are on a small-plot basis, where plots are just over 100 square feet as opposed to acres. Last year's data did not show that we could bump the seeding rate down as low on some cultivars. This does show that the seeding rate can be bumped down in certain situations without loss of yield.0110

Furrow-Irrigated Rice: Furrow-irrigated rice results suggest for the second year in a row that areas of the field where water is not backed up (upper ½ to 2/3) may benefit from an increased seeding rate. For the hybrid, RT7421 FP, an average of 1.6 bushels per acre were gained for every additional seed per square foot over 4 in the upper 2/3 of the field. For comparison, that's an additional 7 bushels per acre for every additional 10 pounds per acre seeding rate. There were mixed results for inbred varieties. CLL18 benefited from increasing the seeding rate up to near 70 pounds per acre, while DG263L and Ozark yields were not heavily influenced by a higher seeding rate. In fact, DG263L yield decreased with higher seeding rates in the lower end of the field.