2022 Missouri Rice Nitrogen Trials

Flood-Irrigated and Furrow-Irrigated Production Systems

Conducted by the *University of Missouri Rice Agronomy Program*

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Rice Agronomy

2022 Missouri Planting Date / Furrow-Irrigated Rice Cultivar 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 |
|------------------|-------------------------------|---------------|-----------------------|------------|--------------|-----------|------------------|------------------|--------------|------------------|
| FDRC Flood | Portageville, Pemiscot County | May 12 | May 22 | June 22 | October 7 | Clay | Research Station | Flood | Variable | Variable |
| MRRMC FIR Top | Glennonville, Dunklin County | May 19 | May 28 | June 21 | October 21 | Silt Loam | Research Station | Non-Flood | Variable | Variable |
| MRRMC FIR Middle | Glennonville, Dunklin County | May 19 | May 28 | June 21 | October 21 | Silt Loam | Research Station | Muddy | Variable | Variable |
| MRRMC FIR Bottom | Glennonville, Dunklin County | May 19 | May 28 | June 21 | October 21 | Silt Loam | Research Station | Flood | Variable | Variable |
| FDRC FIR Top | Portageville, Pemiscot County | April 27 | May 8 | June 5 | September 14 | Silt Loam | Research Station | Non-Flood | Variable | Variable |

Materials & Methods: The flood-irrigated rice variety x nitrogen (VxN) trial was conducted at Portageville with two cultivars, RT XP753 and Diamond, four nitrogen rates (0, 80, 120, and 160 lbs N/ac), and two timings [single preflood and 2-way split with second application made at midseason (at least green ring stage and 4 weeks after preflood incorporation)]. One furrow-irrigated VxN trial was conducted in the top, middle, and bottom of the field at the Rice Farm and included CLL16 and DG263L with either 0 N applied, a single preflood application of 120 lbs N/ac, three applications of 46 lbs N/ac, four applications of 46 lbs N/ac, or 60 lbs N/ac applied at preflood timing, 60 lbs N/ac applied two weeks later, and 46 lbs N/ac applied one week after the second application. The second VxN trial in furrow-irrigated rice was altered due to space constraints and included DG263L under the same N management strategies as the other furrow-irrigated trial. However, there were two timings for the first N application, either at 4-leaf or 6-leaf stage, to determine the optimum time to initiate N fertilization in furrow-irrigated rice.

2022 Portageville Flood Rice VxN

| Cultivar | N Rate | App Method | Yield |
|----------|--------|------------|-------|
| | lb/ac | Splits | bu/ac |
| Diamond | 0 | 0 | 156 |
| Diamond | 80 | SPF | 172 |
| Diamond | 120 | SPF | 189 |
| Diamond | 160 | SPF | 186 |
| Diamond | 80 | 2-way | 160 |
| Diamond | 120 | 2-way | 185 |
| Diamond | 160 | 2-way | 186 |
| | | | |
| RT XP753 | 0 | 0 | 177 |
| RT XP753 | 80 | SPF | 197 |
| RT XP753 | 120 | SPF | 199 |
| RT XP753 | 160 | SPF | 207 |
| RT XP753 | 80 | 2-way | 173 |
| RT XP753 | 120 | 2-way | 198 |
| RT XP753 | 160 | 2-way | 198 |
| | | | · |
| AVERAGE | | | 184 |

Conclusions: With quick flood establishment (1-2 days after application), a single preflood application provided either the same or slightly greater yield potential compared to a 2-way split with the same season-total N rate. A SPF of 120 lbs N/ac maximized yield potential in Diamond, while a SPF of 160 lbs N/ac maximized the yield of RT XP753, although 80 lbs N/ac was more economical.

In furrow-irrigated rice at MRRMC, all three- to four-way split applications maximized yield potential of both CLL16 and DG263L in all three portions of the field. At Portageville (FDRC), yield potential was greatest with the 60-60-46 lbs N/ac split was utilized, with a season-total N rate of 166 lbs N/ac, regardless of the initiation timing.

2022 Missouri Furrow-Irrigated Rice VxN - MRRMC

| | N Rate Applied | | | | | Yield | | | |
|----------|----------------|------|------|------|-------|-------|--------|--------|---------|
| Cultivar | Wk 1 | Wk 2 | Wk 3 | Wk 4 | Total | Тор | Middle | Bottom | AVERAGE |
| | lb N/ac | | | | | | bı | u/ac | |
| CLL16 | 0 | 0 | 0 | 0 | 0 | 95 | 126 | 159 | 126 |
| CLL16 | 120 | 0 | 0 | 0 | 120 | 115 | 155 | 172 | 147 |
| CLL16 | 46 | 46 | 46 | 0 | 138 | 127 | 158 | 174 | 153 |
| CLL16 | 46 | 46 | 46 | 46 | 184 | 132 | 157 | 174 | 154 |
| CLL16 | 60 | 0 | 60 | 46 | 166 | 136 | 160 | 174 | 157 |
| | | | | | | | | | |
| DG263L | 0 | 0 | 0 | 0 | 0 | 123 | 176 | 159 | 153 |
| DG263L | 120 | 0 | 0 | 0 | 120 | 155 | 178 | 179 | 171 |
| DG263L | 46 | 46 | 46 | 0 | 138 | 156 | 186 | 190 | 177 |
| DG263L | 46 | 46 | 46 | 46 | 184 | 171 | 186 | 183 | 180 |
| DG263L | 60 | 0 | 60 | 46 | 166 | 163 | 181 | 183 | 175 |
| | | | | | | - | | | |
| AVERAGE | | | | | | 137 | 166 | 174 | 159 |

2022 Missouri Furrow-Irrigated Rice VxN - FDRC

| | | N Rate Applied | | | | | | |
|----------|-----------|----------------|------|---------|------|-------|-------|--|
| Cultivar | First App | Wk 1 | Wk 2 | Wk 3 | Wk 4 | Total | Yield | |
| | | | | lb N/ac | | | bu/ac | |
| DG263L | 4-leaf | 0 | 0 | 0 | 0 | 0 | 100 | |
| DG263L | 4-leaf | 120 | 0 | 0 | 0 | 120 | 130 | |
| DG263L | 4-leaf | 46 | 46 | 46 | 0 | 138 | 173 | |
| DG263L | 4-leaf | 46 | 46 | 46 | 46 | 184 | 188 | |
| DG263L | 4-leaf | 60 | 0 | 60 | 46 | 166 | 213 | |
| | | | | | | | | |
| DG263L | 6-leaf | 0 | 0 | 0 | 0 | 0 | 68 | |
| DG263L | 6-leaf | 120 | 0 | 0 | 0 | 120 | 100 | |
| DG263L | 6-leaf | 46 | 46 | 46 | 0 | 138 | 143 | |
| DG263L | 6-leaf | 46 | 46 | 46 | 46 | 184 | 168 | |
| DG263L | 6-leaf | 60 | 0 | 60 | 46 | 166 | 230 | |
| | | | | | | | | |
| AVERAGE | | | | | | | 151 | |