

Knockouts of Drought Sensitive Genes Improve Rice Grain Yield under both Drought and Well-watered Field Conditions

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| Location | Treatment | Line ID | Number of events | Yield (g/plant) (average ± SE) | Change | P value ^d |
|----------|------------|-----------------------------|------------------|--------------------------------|--------|----------------------|
| Hainan | Drought | Control ^a | - | 3.91 ± 0.38 | - | - |
| | | DP2317(CRISPR) ^b | 6 | 4.66 ± 0.35 | 18% | 0.0488 |
| | | DP2354(CRISPR) ^c | 12 | 5.16 ± 0.35 | 30% | 0.001 |
| | Well-Water | Control | - | 23.75 ± 0.69 | - | - |
| | | DP2317(CRISPR) | 6 | 24.52 ± 0.65 | 3% | 0.3362 |
| | | DP2354(CRISPR) | 12 | 25.21 ± 0.62 | 6% | 0.0654 |
| Ningxia | Drought | Control | - | 23.38 ± 1.03 | - | - |
| | | DP2354(CRISPR) | 12 | 28.67 ± 1.52 | 23% | 0.0012 |
| | Well-Water | Control | - | 32.62 ± 1.13 | - | - |
| | | DP2354(CRISPR) | 12 | 34.21 ± 1.87 | 5% | 0.4172 |

Note: ^a T₂ or T₃

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|------------|---|--------------|-----|--------|--------|
| DP2317 (E) | 3 | 26.21 ± 0.83 | 10% | 0.0101 | 0.0022 |
|------------|---|--------------|-----|--------|--------|

Note: ^a T₂ or T₃ seeds of non-edited lines from transformations with DP2317 were used as control. ^b 6 DP2317-edited homozygous lines were used in the experiments as showed in Supplemental Figure S3. ^c DP2317 (E), 3 early translation terminated lines (DP2317P.05B.24, DP2317P.11B.05, and DP2317P.11B.28). ^d DP2317 (L), 3 late translation terminated lines (DP2317P.01B.01, DP2317P.02B.05, and DP2317P.03B.01). ^e statistical analyses of yields compared to control

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|--|------------|----------------|---|--------------|-----|--------|
| | | Control | - | 32.62 ± 1.13 | - | - |
| | Well-water | DP2805(CRISPR) | 7 | 39.29 ± 1.28 | 20% | 0 |
| | | DP2805-sgRNA1 | 3 | 39.51 ± 1.75 | 21% | 0.0002 |
| | | DP2805-sgRNA3 | 4 | 39.13 ± 1.59 | 20% | 0.0002 |

Note: ^a T₂ seeds of non-edited lines from transformation with DP2805 were used as control. ^b 7 DP2805-edited homozygous lines at sgRNA-1 site (Supplemental Figure S5A and S5B). ^c 10 DP2354-edited homozygous lines at sgRNA-3 site (Supplemental Figure S5C and S5D) were used in the experiments; and ^d statistical analyses of yields compared to control, 4 replicates and 6 plants per replicate. CRISPR, CRISPR-Cas9 construct.

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