Supplemental Table 1. Root and water uptake parameters detected through the MRI and destructive measurements. Each point is the average of two replications of two genotypes (n=4). Total root length (RL) is the sum of visible and disappeared root length in the MRI. WinRHIZO (WR) root length was measured at destructive harvests at the end of the experiment. Root and water dynamics were measured up to 43 days after germination (DAG).

| Root Class | DAG | Total RL (m) | Disappeared RL (m) | Visible RL (m) | Root Length Density (cm cm⁻³) | Water Uptake (ml) | WR Root Length (m) |
|------------|-----|--------------|---------------------|----------------|-------------------------------|------------------|---------------------|
| Nodal      | 19  DAG | 2.25         | 0                   | 2.235          | 0.08                          | 23.305           | -                   |
|            | 29  DAG | 27.5         | 0.07                | 27.435         | 1.19                          | 23.555           | -                   |
|            | 35  DAG | 80.1         | 0.05                | 80.015         | 3.70                          | 23.84            | -                   |
|            | 43  DAG | 81.75        | 40.085              | 41.67          | 1.44                          | 28.75            | 111.76              |
| Seminal    | 19  DAG | 7.15         | 0                   | 7.155          | 0.36                          | 17.58            | -                   |
|            | 29  DAG | 18.2         | 1.4                 | 16.815         | 1.16                          | 7.48             | -                   |
|            | 35  DAG | 33           | 1.72                | 31.26          | 2.81                          | 12.505           | -                   |
|            | 43  DAG | 38.6         | 15.615              | 22.985         | 1.58                          | 16.34            | 51.475              |
Supplemental Table 2. Plant growth parameters of the split root system experiment. Data was collected on two genotypes (arena and Tkn24b) up to 43 days after germination (DAG). Data shown are means (n=4).

| DAG | Tiller # | Height (cm) | Leaf Area (cm²) | Shoot Dry Weight (g) |
|-----|---------|-------------|-----------------|---------------------|
| 19  | 1       | 15.9        | -               | -                   |
| 29  | 3       | 26.7        | -               | -                   |
| 34  | 3.5     | 31.8        | -               | -                   |
| 43  | 4.5     | 42.75       | 101.2           | 0.4                 |