Supplementary figure S1

- 30 hag
- 90° right
- 90° left
- time T
- 90° right
- 90° left

- Crncl-shaped
- time T
- 90° right
- 90° left
- time T

- Stair-shaped
- 3.5 days of repeated rotations
- 2.5 days of non-stimulated growth

- harvest
- GUS staining
- fluorescent fraction observations
Supplementary figure S3

A

Control

1h 3h 6h 12h 24h

(1) : gravistimulated segment
(2) : non-gravistimulated segment

B

% of root turns with LR

0.0 10.0 20.0 30.0 40.0 50.0 60.0 70.0 80.0 90.0 100.0

3 h 6 h 12 h 24 h

C

% of straight zones with LR

na

3 h 6 h 12 h 24 h

D

Root length (cm)

0.00 0.50 1.00 1.50 2.00 2.50 3.00 3.50 4.00

whole root gravistimulated segment non-gravistimulated segment

E

LR density (event/cm)

0.00 2.00 4.00 6.00 8.00 10.00 12.00

gravistimulated segment non-gravistimulated segment

(1) : gravistimulated segment
(2) : non-gravistimulated segment

Supplementary figure S3

(1) : gravistimulated segment
(2) : non-gravistimulated segment
Supplementary figure S4

The RootInit algorithm

**INPUT**
- `time_length` = observation duration
- `initial_pool` = starting auxin reserve
- `production_per_hour` = amount of auxin produced during 1 hour
- `T1` = spontaneous initiation threshold
- `T2` = induced initiation threshold
- `G` = auxin consumption following gravistimulation
- `grav_signal[t]` = array of boolean representing the gravistimulation signal, set to true if there is a gravistimulation at time `t`, set to false otherwise

**OUTPUT**
- `initiation[t]` = array of booleans representing the initiation process, set to true if an LRI occurs at time `t`, set to false otherwise

**RootInit Algorithm**

```python
auxin_pool = initial_pool
for t = 0 to time_length :
  if auxin_pool < T1 :
    auxin_pool = auxin_pool + production_per_hour
  if grav_signal[t] = true :
    auxin_pool = auxin_pool - G
    if auxin_pool < 0 :
      auxin_pool = 0
  if auxin_pool >= T1 or grav_signal[t] = true :
    initiation_signal = true
  else initiation_signal = false
  if initiation_signal = true and auxin_pool > T2 :
    initiation[t] = true
  else initiation[t] = false
  if initiation[t] = true :
    auxin_pool = 0
```

Supplementary figure S5

Harvest, coloration, fixation and observation
Supplementary figure S6

A

\[ \frac{h_1}{h_2} \]

\[ \begin{array}{cccccccc}
0 & b/2 & b & \rho/3 & \rho & \rho \approx 1.8b & \rho \\
1 & 3 & & & & & \\
\end{array} \]

B

\[ b \]

C

D

\[
\begin{array}{cccccc}
\rho \text{ value} & b/2 & b & 1.2b & 1.8b & 2b & 3b & \infty \\
\hline
h_1/h_2 & \infty & 3 & 2.42 & 1.77 & 1.66 & 1.4 & 1 \\
\end{array}
\]

E

F

\[
\begin{array}{cccc}
\text{root hair length (mm)} & \text{Inside root turn} & \text{Outside root turn} & \text{First side of straight roots} & \text{Second side of straight roots} \\
0.00 & 0.05 & 0.10 & 0.15 & 0.20 & 0.25 & 0.30 & 0.35 & 0.40 & 0.45 & 0.50 \\
\end{array}
\]