**S1 Appendix: Reaction-Diffusion Model Equations**

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**Table A. Parameters for the RDE model as adapted from Rietkerk (2002).**

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| Parameter | Description | |
|  | Plant dispersal | |
|  | | Diffusion coefficient for soil water |
|  | | Diffusion coefficient for surface water |
| *O* [*mm* ] | | Surface water |
| *P* [] | | Plant density |
|  | | Rainfall (ranged between 0 to 3) |
| *W* [*mm*] | | Soil water |
|  | | Water infiltration rate in absence of plants |
|  | | Conversion of water uptake by plants to plant growth |
|  | | Specific loss of plant density due to mortality |
|  | | Maximum specific water uptake |
|  | | Half-saturation constant of specific plant growth and water uptake |
|  | | Saturation constant of water infiltration |
|  | | Specific soil water loss due to evaporation and drainage |
|  | | Maximum infiltration rate |