Supplementary Table S1. Ballistic model description

According to Fukui *et al*. (1980) the three directional components of the movement of each drop can be expressed as:

$$A_x = \frac{d^2x}{dt^2} = -\frac{3}{4}\frac{\rho_a}{\rho_w}\frac{C}{D}V(U_x - W_x)$$

$$A_y = \frac{d^2y}{dt^2} = -\frac{3}{4}\frac{\rho_a}{\rho_w}\frac{C}{D}V(U_y - W_y)$$

$$A_z = \frac{d^2z}{dt^2} = -\frac{3}{4}\frac{\rho_a}{\rho_w}\frac{C}{D}Vz - g$$

where x, y, z are the coordinates referring to the ground (with origin at the sprinkler nozzle), t the time, ρ_a the air density, ρ_w the water density, A the acceleration of the drop in the air, D the drop diameter, and C is a drag coefficient.

The classical Runge-Kutta method of second order:

$$\vec{A}^0 = \vec{A}\left(\vec{R}^0, \vec{V}^0\right)$$

$$\vec{R}^1 = \vec{R}^0 + \frac{2}{3}\vec{V}^0\Delta t$$

$$\vec{V}^1 = \vec{V}^0 + \frac{2}{3}\vec{A}^0\Delta t$$

$$\vec{A}^1 = \vec{A}\left(\vec{R}^1, \vec{V}^1\right)$$

$$\vec{R}^2 = \vec{R}^0 + \frac{1}{4}(\vec{V}^0 + 3\vec{V}^1)\Delta t$$

$$\vec{V}^2 = \vec{V}^0 + \frac{1}{4}(\vec{A}^0 + 3\vec{A}^1)\Delta t$$

with $\vec{R}^0$ the initial position and Δt the time step size.

$$\Delta t = \frac{\varepsilon}{\mu}$$

where $\mu = \frac{3}{4}\frac{\rho_a}{\rho_w}\frac{C}{D}V$; and ε=0.2.

Supplementary table to the article "Simulating water distribution patterns for fixed spray plate sprinkler using the ballistic theory", by Sofiane Ouazaa, J. Burguete, P. Paniagua, R. Salvador and N. Zapata. Spanish Journal of Agricultural Research Vol. 12 No. 3, September 2014 (http://dx.doi.org/10.5424/sjar/2014123-5507)