**Appendix**

**Appendix 1.** Parameter estimates of the Rosin-Rammler model fit to droplet size distribution obtained from the laboratory experiment conducted at the Lonoke Extension Center (AR) to evaluate the droplet size for herbicide spray solutions and nozzle type pairings used for the field experiment.a,b

|  |  |  |
| --- | --- | --- |
| Nozzle  | Herbicide | Parameter estimates and standard errors |
|  |  | c | se | m | se |
| XR | Glufosinate | 167.62 | 0.41 | 2.89 | 0.02 |
|  |  |  |  |  |  |
| AIXR | 2,4-D | 362.10 | 1.24 | 2.27 | 0.02 |
|  | 2,4-D+glufosinate | 349.13 | 1.40 | 2.15 | 0.02 |
|  |  |  |  |  |  |
| TTI | Dicamba | 900.53 | 1.39 | 2.86 | 0.02 |
|  | Dicamba + glufosinate | 858.66 | 1.00 | 3.31 | 0.01 |

aRosin–Rammler (RR) equation fit to the cumulative % volume of droplets data to predict the percent of driftable fines (% spray volume containing droplets < 150 μm in diameter) using nonlinear least squares regression (nls) in R version 4.0.0.

$$V\left(d\right)=100-100\*exp⁡(-\left(\frac{d}{c}\right)^{m})$$

where V is the cumulative % volume of droplets with the diameter lower than a certain value (d). c is the characteristic droplet diameter, defined as the diameter at which the cumulative volume fraction is 63.2%. m is a constant indicating the uniformity of the distribution.

bNozzle information: XR, Extended Range Flat Fan; AIXR, Air Induction Extended Range; TTI, Turbo TeeJet Induction. All nozzles were 110015 size tips and were manufactured by TeeJet Technologies, Spraying Systems Co., Glendale Heights, IL 60139.

**Appendix 2.** Parameter estimates of the 4-parameter log-logistic model fit to droplet size and velocity data obtained from the laboratory experiment conducted at the Lonoke Extension Center (AR) to compare herbicide spray solution and nozzle type pairings used for the field experiment.a,b

|  |  |  |
| --- | --- | --- |
| Nozzle  | Herbicide | Parameter estimates |
|  |  | b | se | c | se | d | se | e | se |
| XR | Glufosinate | -4.54 | 0.35 | 1.63 | 0.01 | 5.50 | 0.53 | 272.54 | 16.74 |
|  |  |  |  |  |  |  |  |  |  |
| AIXR | 2,4-D | -3.92 | 0.11 | 1.19 | 0.02 | 6.51 | 0.11 | 319.07 | 4.29 |
|  | 2,4-D+glufosinate | -3.75 | 0.12 | 1.27 | 0.01 | 6.33 | 0.14 | 342.12 | 5.92 |
|  |  |  |  |  |  |  |  |  |  |
| TTI | Dicamba | -2.15 | 0.03 | 0.60 | 0.01 | 4.97 | 0.05 | 486.51 | 6.07 |
|  | Dicamba + glufosinate | -2.17 | 0.04 | 0.56 | 0.01 | 5.19 | 0.07 | 502.64 | 7.15 |

aFour-parameter log-logistic model fit to droplet size and velocity paired measurements data using nonlinear least squares regression (nls) in R version 4.0.0.

$$Y=c+\frac{d-c}{1+exp⁡[b\left(log⁡(x)-log⁡(e\right)]}$$

where Y is the droplet exit velocity (m s-1), b is the slope at the inflection point, c is the lower limit (m s-1), d is the upper limit (m s-1), e is the inflection point, and x is the droplet size (µm).

bNozzle information: XR, Extended Range Flat Fan; AIXR, Air Induction Extended Range; TTI, Turbo TeeJet Induction. All nozzles were 110015 size tips and were manufactured by TeeJet Technologies, Spraying Systems Co., Glendale Heights, IL 60139.