SUPPORTING INFORMATION

Physiological factors affecting uptake and translocation of glufosinate

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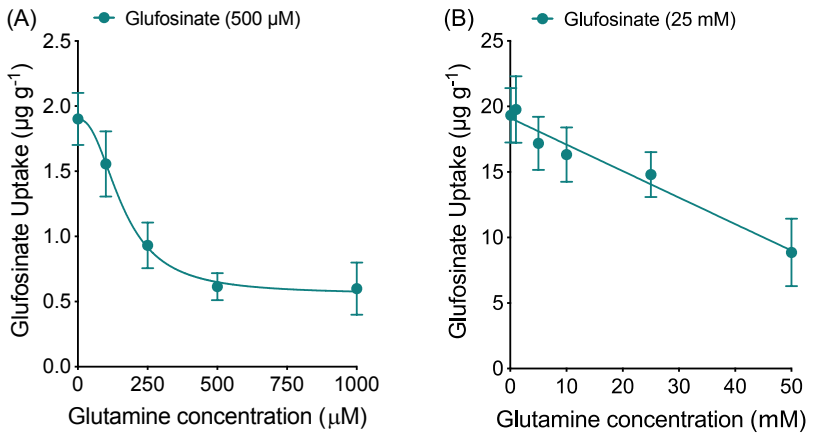

Figure S1. Glufosinate uptake in Palmer amaranth leaf discs over increasing µM concentrations of glutamine (A), or mM concentrations of glutamine (B). Glufosinate uptake decreases as glutamine concentration increases. The response saturates under low levels of glutamine, indicating the involvement of an active transport. In contrast, the effect is linear under high concentrations of glutamine, which suggests that uptake is driven by passive movement. These results support those presented in Figure 1. Data was pooled from two experiments with three replications (total n = 6). *means are significantly different by t-test ($p<0.05$). Gln: glutamine.

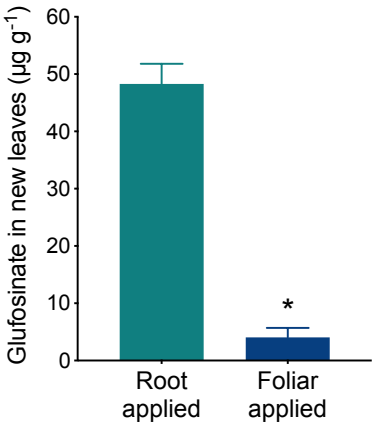

Figure S2. Glufosinate concentration in the apical meristem leaves when the herbicide was applied through roots or leaves. For root application, plants were incubated hydroponically in 20 mM glufosinate for one hour and then transferred to water. For foliar application, plants were sprayed with 560 g ha^{-1} glufosinate. The data suggest that glufosinate translocates more easily through the xylem system. Data was pooled from two experiments with three replications each (total n = 6). *means are significantly different by t-test ($p<0.05$).

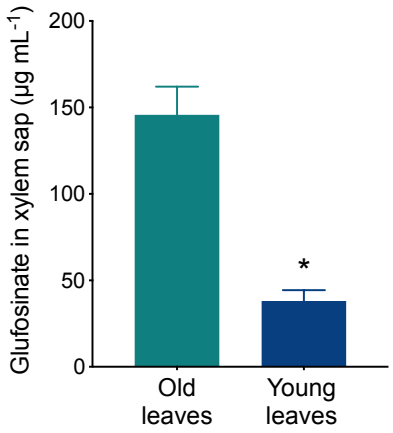

Figure S3. Glufosinate concentration in the xylem sap from old leaves compared to new leaves. Glufosinate was foliar applied at 560 g ha^{-1} and xylem sap was collected from old and new leaves using a pressure bomb. Glufosinate tends to accumulate in old leaves due to the higher transpiration rates. Data was pooled from two experiments with three replications each (total n = 6). *means are significantly different by t-test ($p<0.05$).

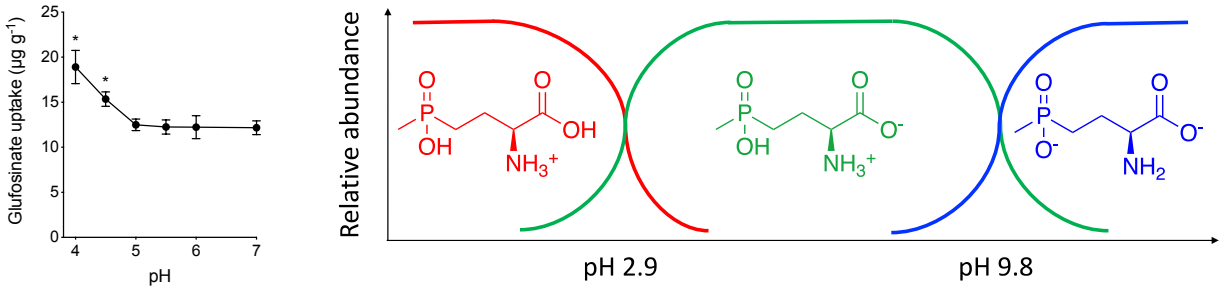

Figure S4. Effect of solution pH on glufosinate uptake in Palmer amaranth. Fifty 5-mm-diam leaf discs were incubated in 10 mM glufosinate solutions at different pH levels from 4 to 7 for 24 h. The solution pH was adjusted with hydrochloric acid before incubation. Higher levels of uptake can be achieved by adjusting the spray solution to acidic pH. This results from the multiple ionization states that glufosinate presents under different pH levels. Protonated glufosinate may cross lipophilic membranes more easily than the ionized state. Data was pooled from two experiments with three replications (total n = 6). *means are significantly different from control (pH 7) by t-test ($p<0.05$).