**Supplemental Materials**

Figure S1. An image of the sample tumbling setup used for the soil transfer experiment, kernel rinsate experiment, and almond-to-almond transfer experiment.

A picture containing text, indoor

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Figure S2. Diagram of the field experiment conducted at Nickels Soil Laboratory. Plots were 19.6 m long by 4 m wide.

Timeline

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Table S1. Results of the rinsate analysis of the washed whole almonds for the soil transfer experiment. Whole almonds tumbled in [14C]-herbicide treated soil were rinsed end-over-end in 20 mL of deionized water. The rinsate was analyzed for [14C]-herbicide using a liquid scintillation counter. A total of 166,500 Bq were added to the soil.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| [14C]-Herbicide | Replicate | Bq | Average Bq | Standard Error (Bq) |
| Glyphosate | 1 | 11,465 | 6,667 | 1,782 |
|  | 2 | 7,073 |
|  | 3 | 4,888 |
|  | 4 | 3,240 |
| Glufosinate | 1 | 5,817 | 6,130 | 2,319 |
|  | 2 | 12,704 |
|  | 3 | 3,899 |
|  | 4 | 2,101 |

Table S2. Results of the swipe analysis of the plastic barrier used to crack the almond shells in the soil transfer experiment. After whole almonds were tumbled in [14C]-herbicide treated soil, almonds were shelled using a plastic barrier to crack the hard outer shell and expose the kernel. The plastic piece was swiped with filter paper and analyzed for [14C]-herbicide using a liquid scintillation counter. A total of 166,500 Bq were added to the soil.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| [14C]-Herbicide | Replicate | Bq | Average Bq | Standard Error (Bq) |
| Glyphosate | 1 | 165 | 154 | 36 |
|  | 2 | 248 |
|  | 3 | 128 |
|  | 4 | 75 |
| Glufosinate | 1 | 121 | 109 | 23 |
|  | 2 | 85 |
|  | 3 | 166 |
|  | 4 | 62 |

Table S3. Results of the post-harvest mimic kernels from the soil transfer experiment. Whole almonds were tumbled in [14C]-herbicide treated soil. After tumbling, the whole almonds were hulled and shelled. The kernels were collected and analyzed for [14C]-herbicide using a liquid scintillation counter. A total of 166,500 Bq were added to the soil.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| [14C]-Herbicide | Replicate | Bq mg-1 | Average Bq mg-1 | Standard Error (Bq mg-1) |
| Glyphosate | 1 | 0.248 | 0.138 | 0.035 |
|  | 2 | 0.097 |
|  | 3 | 0.149 |
|  | 4 | 0.059 |
| Glufosinate | 1 | 0.138 | 0.093 | 0.016 |
|  | 2 | 0.088 |
|  | 3 | 0.063 |
|  | 4 | 0.082 |

Table S4. Results of the rinsate analysis of the whole almond wash in the almond-to-almond transfer experiment. The experiment was only conducted with glyphosate due to the available amount of [14C]-glufosinate. Two whole almonds were dotted with a total of 166,500 Bq of [14C]-glyphosate and tumbled with whole untreated almonds. The treated almonds were removed and the untreated were rinsed in 20 mL of deionized water. The rinsate was analyzed for [14C]-glyphosate using a liquid scintillation counter.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 14C-Herbicide | Replicate | Bq | Average Bq | Standard Error (Bq) |
| Glyphosate | 1 | 1,853 | 1,534 | 265 |
|  | 2 | 1,002 |
|  | 3 | 1,173 |
|  | 4 | 2,109 |