

DRAFT – MAY 13, 2021

1 A FIELD SPRAY DRIFT STUDY TO DETERMINE THE DOWNWIND EFFECTS OF  
2 ISOXAFLUTOLE HERBICIDE TO NON-TARGET PLANTS

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4 **ABSTRACT** – Spray drift buffers are often required on herbicide labels to prevent drift effects  
5 to non-target plants. Buffers are typically derived by determining the distance at which predicted  
6 exposure from spray drift equals the ecotoxicology threshold for sensitive plant species  
7 determined in greenhouse tests. Field studies performed under realistic conditions have  
8 demonstrated, however, that this approach is far more conservative than necessary. In 2016, the  
9 US Environmental Protection Agency (EPA) estimated that isoxaflutole (IFT), an herbicide used  
10 to control grass and broadleaf weeds, could adversely affect downwind non-target dicot plants at  
11 distances of  $\geq 997$  feet (304 m) from the edge of the treated field due to spray drift. This  
12 prediction implies that a buffer of at least 997 feet is required to protect non-target plants. To  
13 refine the potential buffer distance for IFT, we conducted a field study in which sensitive non-  
14 target plants (lettuce and navy bean, 2-4 leaf stage) were placed at various distances downwind  
15 from bare fields sprayed with Balance<sup>®</sup> Flexx Herbicide. The test plants were then transported to  
16 a greenhouse for grow out following the standard vegetative vigor test protocol. There were three  
17 trials. One had vegetation in the downwind deposition area (i.e., test plants placed in mowed  
18 grass; typical exposure scenario) and two had bare ground deposition areas (worst-case exposure  
19 scenario). For both plant species in bare ground deposition areas, effects on shoot height and  
20 weight were observed at 5 feet (1.5 m) but not at downwind distances of 30 feet (9.1 m) and  
21 greater from the edge of the treated area. No effects were observed at any distance for plants  
22 placed in the vegetated deposition area. The field study demonstrated that a buffer of 30 feet (9.1  
23 m) protects non-target terrestrial plants exposed to IFT via spray drift even under worst-case

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1 conditions.

2 **Keywords:** Herbicide, Spray drift, Field study, Non-target terrestrial plants, Buffers