

SAFLUFENACIL: DISCOVERY AND MODE OF ACTION OF A NEW BROADLEAF HERBICIDE. Rex A. Liebl, Dan E. Westberg and Steven J. Bowe, BASF Corporation, Research Triangle Park, NC 27709.

Saflufenacil is a new herbicide developed by BASF for dicot weed control. The starting point for the discovery of saflufenacil was a class of chemistry called benzoisothiazoles. This chemistry class possessed potent herbicidal activity but lacked desired selectivity and bio-availability properties. Efforts were made to optimize the molecule in several ways including opening the isothiazole ring to create a carboxamide side chain that improved herbicidal performance. These optimizations ultimately led to the pyrimidinedione chemistry class and the discovery of saflufenacil. Physiological and biochemical profiling confirmed that saflufenacil was a protoporphyrinogen-IX-oxidase (PPO) inhibitor. Saflufenacil elicits similar symptoms as other peroxidizing herbicides including rapid, light dependent necrosis of foliar tissue. Saflufenacil is readily absorbed by root and shoot tissue of plants. Once absorbed, Saflufenacil is predominantly translocated via the xylem, with limited movement via the phloem. Saflufenacil is highly effective on dicot weeds controlling them through both contact and residual activity. In addition to non-crop and preplant burndown utility, saflufenacil demonstrates preemergence selectivity in a wide range of crops. Selectivity is conferred by physical placement and rapid metabolism of saflufenacil in tolerant crop species such as corn. Thousands of laboratory, greenhouse and field studies by BASF and university researchers culminated with the US registration of saflufenacil in September 2009. BASF identifies the saflufenacil active ingredient with the trademark Kixor®. Several solo and mixture products based on saflufenacil / Kixor® will be offered under the product names of Sharpen™, Integrity™, OpTill™, Treevix™, Heat™ and Eragon™.